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# **INTERIM REMEDIAL MEASURES (IRM) WORK PLAN**

## **BUILDINGS 1 AND 3 ACTIVE SUBSLAB DEPRESSURIZATION (ASD) SYSTEM**

**170 JAMISON ROAD SITE  
ELMA, NEW YORK**

**(NYSDEC BCP SITE No. C915315)**

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February 2020

0400-017-001

Prepared for:  
**MOOG INC.**

Prepared by:



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## CERTIFICATION

I, Thomas H. Forbes, P.E., certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measures Work Plan (IRMWP) Buildings 1 and 3 Active Subslab Depressurization (ASD) System for the 170 Jamison Road Site (Site No. C915315) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

License No.: 070950

Date: 2-26-20

Registration State: New York

SEAL:



**INTERIM REMEDIAL MEASURES WORK PLAN  
ACTIVE SUBSLAB DEPRESSURIZATION SYSTEM  
BUILDINGS 1 AND 3  
170 Jamison Road Site  
Elma, New York**

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Elma, New York**

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## 1.0 INTRODUCTION

This document presents the proposed active subslab depressurization (ASD) system design for the existing Building 1 and Building 3 for the 170 Jamison Road Brownfield Cleanup Program (BCP) site (Site), located at 170 Jamison Road, Elma, New York (see Figures 1 and 2).

### 1.1 Background and History

The Site, designated as 170 Jamison Road, consists of portions of five tax parcels, totaling approximately 4.48 acres, located in Elma, Erie County, New York (see Figures 1 and 2). The Site is currently developed with four structures on-Site (Buildings 1, 1A, 3 and 3A). 300 Jamison Road, 170 Jamison Road, 170 Seneca Street and 0 Seneca Street are the addresses associated with this property. This work plan is only related to Buildings 1 and 3; ASD systems were installed in Buildings 1A and 3A during recent construction of those buildings.

The Site is bound by Jamison Road and commercial and residential properties to the north, Moog property and facilities and Seneca Street to the south and east, and Moog property and vacant land to the west. Existing Building 1 is currently used for office space while the first floor of Building 3 is used for product testing and the second floor of Building 3 is used for office space.

Remedial Investigation (RI) field work has been completed from June 2017 through October 2019. Results of the RI sub-slab vapor/indoor air sampling indicate that ASD systems are required to mitigate potential soil vapor intrusion in Buildings 1 and 3. The purpose of this IRM Work Plan is to document the measures to be undertaken by Moog to protect the existing Buildings 1 and 3 from potential soil vapor intrusion from residual subsurface contamination.

Building 1 is currently being renovated; therefore, Moog prefers to install the ASD system in Building 1 in February-April 2020 during renovation activities to avoid future business disruption during normal operations. The renovation is being completed in two phases; the western portion of the building is being renovated in February-March 2020 and the eastern portion is being renovated in March-April 2020.

## 2.0 ACTIVE SUB-SLAB DEPRESSURIZATION (ASD) SYSTEM DESIGN & INSTALLATION

### 2.1 General

An ASD system creates a low-pressure zone beneath a building slab using a powered blower(s) connected via piping to create a vacuum beneath the building foundation. The low-pressure field prevents soil gas from entering the building. In an existing building where an ASD system will be retro-fitted, communication testing is typically done to estimate where suction pits and piping runs can be efficiently and aesthetically installed. During installation, there may be conditions encountered that will necessitate relocation of some of these features and may necessitate variations to the design. However, under all circumstances post-installation communication testing will be completed to confirm the building is properly protected.

#### 2.1.1 Building 1

Building 1 was originally constructed in approximately 1950, with a series of 6 additions constructed between 1954 and the 1990s, with the total current building area nominally 30,000 square feet (SF). Figure 3 shows the 7 sub-areas of Building 1, arbitrarily designated for ease of discussion. The sub-areas are discussed below:

Sub-Area Number	Nominal Dimensions (LxW) (feet)	Area (SF)
1	63' x 89'	5,600
2	63' to 86' x 180'	13,500
3	21' x 30'	650
4	45' x 45'	2,000
5	35' to 43' x 110'	4,100
6	32' to 43' x 90'	3,050
7	22' x 35'	770

Based on an historical foundation drawing for the planned construction of the 1954 addition (Sub-Area 1), the foundation consisted of slab on grade with pile foundations. A

stone subbase of unknown thickness was shown beneath the slab. Historical foundation drawings for the other sub-areas of the building were not provided to Benchmark.

### **2.1.2 Building 3**

Building 3 was built in the 1960s and consists of a nominal 25,000 SF slab on grade with pile foundations. An historical drawing indicates a 6” stone layer exists below the building slab.

## **2.2 Communication Testing**

Communication testing was completed on November 7, 2017 at specified locations in Sub-Areas 1 and 2 of Building 1 and in Building 3. The areas in Building 1 were limited so as not to interfere with the Moog employees and operations. Additional communication testing was completed in Building 1 on January 21, 2020 in Sub-Areas 3 through 6.

The purpose of this testing was to assess the vacuum field generated from a suction point (SP) at strategically located monitoring points (MP); and thus, to gauge the radius of influence (ROI) (i.e., the point at which a vacuum of at least 0.004 inches of water column (WC) was identified in the sub-base materials). This was done by inducing a vacuum in the subsurface and monitoring the differential pressure in monitoring points to assist in designing the layout for the permanent suction points. Suction points were created by drilling a 3” diameter hole through the floor slab. A rigid section of 3” polyvinyl chloride (PVC) pipe was inserted into the hole and connected to a blower (capable of developing up to 10 inches of WC). Clay was used to seal the hole between the floor slab and the pipe. Monitoring points were drilled at several locations away from the suction points and consisted of ½” holes drilled through the floor slab. Flexible Tygon tubing was connected to a handheld manometer and inserted in the monitoring points. The outside of the Tygon tubing was sealed with clay. The blower was activated, and the vacuum was measured at the monitoring points. The results are provided on Figure 3 and discussed below.

### **2.2.1 Building 1 Communication Testing Results**

Communication testing was done from six suction points; one in each of 6 sub-areas, 1-SP-1 through 6-SP-6 (Sub-Area 7 was not tested). The induced vacuum was measured at monitoring points established in each sub-area. Figure 3 shows the results of the testing which

indicated that the ROI varies by sub-area and ranges between approximately 25 feet and 50 feet+.

### ***2.2.2 Building 3 Communication Testing Results***

There were two suction pits completed in Building 3, 3-SP-1 and 3-SP-2. The ROI from testing at these suction points indicate an approximate 40-foot ROI (Refer to Figure 3).

## **2.3 ASD System Design-Build Approach**

The ASD systems for this project have been designed in general accordance with the EPA design document entitled “Indoor Air Vapor Intrusion Mitigation Approaches” 2008C, OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor to Indoor Air” (USEPA June 2015), the NYSDOH “Guidance for Evaluating Soil Vapor Intrusion in the State of New York” dated October 2006, and (ASTM) “Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings”. Both systems will be constructed under a design-build approach to accommodate potential slab variabilities that may be encountered during installation by real-time communication testing which may result in increasing/decreasing the number of suction pits, location and length of vapor extraction suction pits and/or trenches, number and type of blowers and piping configurations. The following text details portions of the design criteria, methodology, and critical installation methods.

Under all circumstances post-installation communication testing will be completed to confirm the building is properly protected.

## **2.4 ASD System Installation**

The ASD system will be installed by an experienced contractor familiar with sub-slab depressurization systems and/or radon control systems in accordance with the design criteria and specifications contained in Figures 5 thru 8 of this document and/or typical construction practices. Based on the results of the communication testing the designs for Buildings 1 and 3 are different. However, for both buildings any obvious fractures or joints in the slabs and areas around pipe (utility) penetrations through the slabs will be sealed using a polyurethane sealant or non-shrink grout applied in accordance with manufacturer’s instructions.

### 2.4.1 *Building 1 ASD System Construction*

The Building 1 sub-slab depressurization will be completed by using a combination of suction pits and vapor extraction trenches based on the planned interior space usage. Building 1 sub-area installation details are summarized below:

Sub-Area	Depressurization Method	Horizontal Pipe Sizing	Vertical Pipe Sizing	Fan/Blower Specification
1	Suction Pits	4"	3"	Fantech Rn4
2/7	Suction Pits	4"	3"	Fantech Rn4
3	Suction Pits	3"	3"	RadonAway GX5
4	Suction Pits	3"	3"	RadonAway GX5
5	Vapor Extraction Trench	4"	4"	Fantech Rn4
6	Vapor Extraction Trench	4"	4"	Fantech Rn4

Notes:

1. Sub-areas 2 and 7 suction pits will be serviced by the same fan.
2. Fan/Blower specifications are provided in Appendix 1

#### **Sub-Areas 1-4 and 7**

Proposed suction point locations are shown on Figure 4. The current design is conservative, with each suction pit/trench in sub-areas 3 and 4 controlled by an independently operated fan/blower and vent stack. Suction pit's vertical piping in Sub-areas 2 and 7 will extend above the drop-ceiling where they will be joined to horizontal solid PVC header piping which will be connected to a designated blower. Sub-area 1 will be constructed in a similar fashion, with the suction pit(s) vertical piping connected to a horizontal solid PVC header piping above the drop ceiling which will be connected to a designated blower. Vertical piping and horizontal header piping size is listed in the table above for each sub-area. The number of suction points and blowers may increase or decrease based on the findings of the real-time communication testing discussed in Section 3. Fans were selected by determining the vacuum required to achieve negative pressure in the sub-slab and are subject to change based on real-time communication testing results. A minimum of one cubic foot will be cleared for each suction pit. A void space will remain around the vertical piping beneath the slab.

### **Sub-Areas 5 and 6**

Sub-areas 5 and 6 will each consist of vapor extraction trenches measuring approximately 100 feet long and 85 feet long; respectively. Proposed trench locations are shown on Figure 4. The 4” vertical stand-pipe for each system will be connected and controlled by one (1) independently operated blower.

The vapor extraction trench will be constructed by cutting a minimum 10-inch wide opening through the existing concrete slab and digging down a minimum of 12-inches. Slab thickness ranged from 5- to 6-inches in sub-areas 5 and 6 based on the communication testing observations. A former radiant heat system consisting of approximate 1” steel piping within the concrete slab is still present and may contain residual water. During trench cutting, any radiant heat system piping encountered will be cut by an experienced contractor and capped in place to minimize any water loss beneath the slab. Soil generated from beneath any of the buildings will be screened by a qualified environmental professional and segregated based on field indicators of contamination (if any), sampled for waste characterization purposes (including total volatile organic compounds) and transported by a licensed hauler to an approved disposal facility. Any waste characterization sampling results will be included in the final engineering report. Concrete will be transported off-site to an approved recycling facility.

Clean 1” stone will be placed in the bottom of the trench and a 4” perforated PVC pipe will be laid on top with the perforations angled down to allow for condensate drainage. Additional 1” stone will be placed around and above the pipe prior to replacement of the concrete slab. Seams along the trench will be sealed with a polyurethane caulk.

### **Building 1 General Design Criteria**

The vertical vent pipes will be labeled “Sub-Slab Vent Pipe” with 3-inch high letters. The exhaust vent will exhaust a minimum of 12-inches above the surface of the roof and at least 10 feet away from any air intake (refer to Figures 5 thru 7).

Fans/blowers will be hard-wired to a dedicated electrical circuit for which a dedicated breaker will be installed and properly labeled in the breaker box.

A differential pressure indicating transmitter, Magnehelic® gauge, (Dwyer Model 605-2 or similar, with a pressure range determined based upon the maximum working vacuum of the associated blower) will be installed on the vertical vent pipe at a location agreeable with the building maintenance supervisor (See Appendix 2). The Magnehelic gauge will measure

and display the instantaneous negative pressure produced by the blower and indicate the system is operational.

### **2.4.2 *Building 3 ASD System Construction***

Based on our engineering experience and the communication testing completed, the preliminary design will consist of 10 suction points controlled by one (1) operating blower (Refer to Figure 4). However, the number of suction points and/or the number of blowers may increase or decrease based on the findings of the real-time communication testing discussed in Section 3.

A minimum of one cubic foot of space will be cleared beneath the slab in locations of proposed suction points. The suction points will be outfitted with 3” solid PVC vertical stand pipes that will extend above the drop ceiling where they will be joined to a 4” solid PVC header which will be connected to the other suction pits to be connected to the blower. The header will be connected to a 6” vertical pipe which will be attached with a flexible coupling (Fernco or similar) to the blower. The vertical vent pipes will be labeled “Sub-Slab Vent Pipe” with 3-inch high letters on both floors. The vent will exhaust a minimum of 12-inches above the surface of the roof and at least 10 feet away from any air intake (refer to Figure 8).

A differential pressure indicating transmitter, Magnehelic® gauge, (Dwyer Model 605-2 or similar) will be installed on the vertical vent pipe at a location agreeable with the building maintenance supervisor (See Appendix 2). The Magnehelic gauge will measure and display the instantaneous negative pressure produced by the blower and indicates the system is operational.

A Plastec Storm 12 blower (or similar blower; refer to Appendix 1 for specifications) will be installed to the vapor pipe grid on the roof to provide negative pressure in the sub-slab. The blower(s) will be hard-wired to a dedicated electrical circuit for which a dedicated breaker will be installed and properly labeled in the breaker box.

### **2.4.3 *Monitoring of the Systems***

Upon system installation all slab, wall, floor or ceiling penetrations, expansion joints, cracks, and/or any other gaps in the slab and/or subsurface walls, will be sealed using a polyurethane sealant or non-shrink grout applied in accordance with manufacturer’s instructions.

A differential pressure indicating transmitter, Magnehelic® gauge, (Dwyer Model 605 or similar, with an operating range selected based upon the rating of the associated fan) will be installed on the vertical vent pipe leading to each fan as discussed in Sections 2.4.1 and 2.4.2. The Magnehelic gauges will measure and display the instantaneous negative pressure produced by the blowers and indicate the system is operational.

Continuous remote monitoring of the ASD system will be done using Moog's in-house building monitoring system (a Siemens Automation System). The 4-20 mA scalable output from the magnehelic transmitters will be tied into the programmable logic controller (PLC) that monitors building systems, converted to vacuum in inches of water column to facilitate monitoring, and programmed to alarm if pressure falls outside of allowable minimum level (e.g., vacuum falls below or rises above 50% of normal conditions, indicative of blower failure or extraction piping obstruction/break). Moog's maintenance personnel will be notified if an alarm condition occurs and corrective actions will be taken. System failure protocols are more fully described in Section 4.3.



### 3.0 POST-INSTALLATION COMMUNICATION TESTING

#### 3.1 General

The ASD systems will require performance testing to confirm the system effectiveness and proper installation. Post-installation communication testing will be completed during and immediately after system installation. The following steps will be performed, documented, and then reported in the Final Engineering Report.

#### 3.2 Visual Inspection

All system components will be visually inspected by a qualified person to ensure proper installation. With the depressurization system operating, smoke tubes may be used to check for leaks through floor joints and at suction points. Any leaks will be identified, noted, and repaired prior to continuing with testing and confirmation.

#### 3.3 ASD System Confirmation

A field test will be conducted to confirm the negative pressure created beneath the slab. Nominal ¼ inch-diameter holes will be drilled through the concrete slab at locations in Buildings 1 and 3 as shown on Figure 4. Points will be located strategically through the buildings to demonstrate that the project objective has been met (i.e., creation of a negative pressure zone beneath the building slab of at least -0.004” of WC)<sup>1</sup>. With the depressurization system operating, the vacuum will be measured using a handheld digital micro-manometer or comparable instrument at the test locations. Temporary test locations will not be sealed until the normal system operations discussed in Section 4.1 are achieved in each building. Any temporary locations with the potential to be covered during construction work (i.e., new flooring installation) will be sealed using polyurethane caulk and a new temporary test location will be selected, or a new temporary location will be installed in the same general location of the original location after the new floor is installed. One sample point in each sub-area of Building 1 and three sample points in Building 3 will be converted to permanent sampling ports to allow for long-term monitoring; these sample locations will be located the farthest away from blowers/suction pits and/or near historic vacuum monitoring points that exhibited

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<sup>1</sup> Upon completion of the testing, the holes will be sealed with polyurethane caulk.

the lowest initial vacuum readings in the given space. Locations within non-occupied areas, custodial/mechanical and/or electrical rooms will be favored for future ease of access. Concurrent with sub-slab testing, manometer readings for all suction points/blowers will be recorded.

If adequate depressurization is not occurring the following procedures will be enacted:

- All testing procedures will be repeated to ensure proper testing protocols were followed; and,
- Client and NYSDEC personnel will be informed of inadequate vacuum results.

Troubleshooting of the system will then be completed, including the following:

- Confirmation of blower operation;
- Inspection of and sealing/re-sealing of all major entry routes and penetrations (if necessary); and,
- Inspection of the HVAC system and determination whether the HVAC system has a negative effect on the performance of the ASD system.

Upon completion of troubleshooting as described above, if re-testing indicates insufficient communication the following measures will be considered:

- Adjustment of the HVAC system;
- Installation of additional vacuum suction points; and/or
- Blower modification or replacement

### **3.4 Indoor Air/Outdoor Air Sampling Protocols**

A round of indoor air (IA)/outdoor air (OA) analytical testing (EPA Method TO-15) will be conducted in each building during the heating season (typically October through March). Sampling will be completed during heating season and at least 30-days following installation and startup of the ASD systems. If the ASD systems are installed outside of the heating season or at the end of the season, post-mitigation air sampling will be postponed until the following heating season. Per the NYSDOH “Guidance for Evaluating Soil Vapor Intrusion in the State of New York”, IA sampling can be completed once the building’s heating system has operated to maintain normal indoor air temperatures (65 - 75 °F) for at least 24 hours prior to and during the scheduled sampling.

Prior to initiation of IA/OA sampling, a pre-sampling inspection will be performed to identify and minimize conditions that may interfere with the proposed testing. The inspection will evaluate the type of structure, floor layout, airflows and physical conditions of the building, including any existing cracks or holes in the slab. This information, along with information on sources of potential indoor air contamination, will be identified on a building inventory form.

- a. The IA sample will be collected following the procedure below: Sample canisters will be placed at a height above the ground to represent breathing zones (3 – 5 feet) in a secure location;
- b. Samples will be collected over an 8-hour period to reflect the typical work shift completed in each of the buildings;
- c. The qualified environmental professional collecting the samples will avoid lingering in the immediate area of the sampling device while samples are being collected;
- d. Sample flow rates will conform to the specification in the sample collection method and, if possible, will be consistent with the flow rates for concurrent OA samples;
- e. Samples will be collected using laboratory certified clean Summa ® canisters, consistent with EPA Method TO-15, and analyzed for VOCs via EPA's TO-15 method.

The OA sample will be collected following the procedure below:

- a. One upwind location will be selected for sample collection. The sample location will be away from wind obstructions (trees or bushes) and at a height above the ground to represent breathing zones (3 – 5 feet).
- b. The OA sample will be collected concurrent with the IA sample.
- c. The OA samples will be collected using laboratory certified clean Summa ® canisters, consistent with EPA Method TO-15, and analyzed for VOCs via EPA's TO-15 method.

A site sketch will be completed that documents IA/OA sampling locations, location of potential interferences, compass direction, and paved areas. Field notes will be kept documenting the weather conditions and any pertinent observations (odors, field instrumentation readings, significant activities in the vicinity).

Indoor and sub-slab vapor sample results will be reviewed and provided to the Department to determine if additional sub-slab vapor mitigation is required.

## 4.0 ASD SYSTEM OPERATION, MAINTENANCE, & MONITORING

### 4.1 ASD Systems Operation

This ASD systems have been designed for continuous operation with minimal maintenance and/or operational oversight. A “normal” operating pressure will be established for each blower by measuring the pressure at each Magnehelic gauge and establishing a benchmark. Initially, the pressure will be measured approximately 4 hours after initial system start-up. Another reading will be taken and recorded after approximately 1 week of operation to check if significant change in pressure readings is observed relative to the initial “normal” operating pressure. If there is a significant pressure difference from the “normal” operating pressure, additional inspections will be made until the pressure stabilizes. If readings do not stabilize within three weeks, troubleshooting of the system will be completed as described in Section 3.3.

The Magnehelic gauge will monitor the vacuum of each individual system connected to a blower/fan. Systems that are comprised of several suction pits/vertical pipes (sub-area 1, sub-area 2 & 7, and building 3) will be equipped with U-Tube manometers on each vertical pipe connected to suction pit in addition to the Magnehelic gauge that will monitor the vacuum of each individual system. This will allow individual monitoring of each suction pit (U-Tube manometers) and the entire system (Magnehelic gauge) to ensure complete vacuum coverage. The U-Tube manometer installation detail is shown on Figure 5 and 8.

### 4.2 Annual Certification/Inspection

An annual system certification inspection and report documenting that the systems are performing properly and remain effective will be required by the NYSDEC and is to be certified by a professional engineer or environmental professional. The certification report will contain an annual inspection checklist. The annual inspection will require:

- system components to be visually inspected by a qualified person;
- the exhaust blowers to be inspected for signs of abnormal operation or bearing failure (service and/or replacement if necessary);
- discharge location inspection - to verify no air intake has been located nearby vent pipes;

- HVAC system inspection to determine if it is being maintained and operated as designed; and,
- detailed floor, wall, and slab inspection for cracks (resealing if necessary); smoke tubes may be used to check for leaks through floor joints and at suction points with the ASD systems running.

### 4.3 Systems Failure Protocols

In the event that one or more of the system(s) are not working properly (i.e., loss of vacuum), Moog's Siemens ® building automation system will contact designated personnel with repeat contacts made until the alarm condition is acknowledged. The following protocol should be followed:

- The building owner/operator and head maintenance person will be contacted immediately;
- The building owner/operator will apprise the NYSDEC of the system failure;
- The date and time will be recorded;
- The warning device will be identified (e.g., Magnehelic Gauge 1, 2, etc.)
- The blowers will be inspected to confirm operation; if a circuit breaker was tripped causing the blower to cease operation, the circuit breaker will be reset; and,
- System components will be visually inspected for signs of damage or dysfunction.

If the system failure is not remedied, the building owner should contact a qualified engineer or other person with experience in ASD systems to inspect the system and take the necessary measures to place the system back in service. The NYSDEC will be apprised of any system failure or other defect that compromises the system in accordance within 48-hours or as otherwise required in the approved site management plan; full monitoring and notifications requirements will be detailed in the final site management plan, which will supersede this document.

## 5.0 REFERENCES

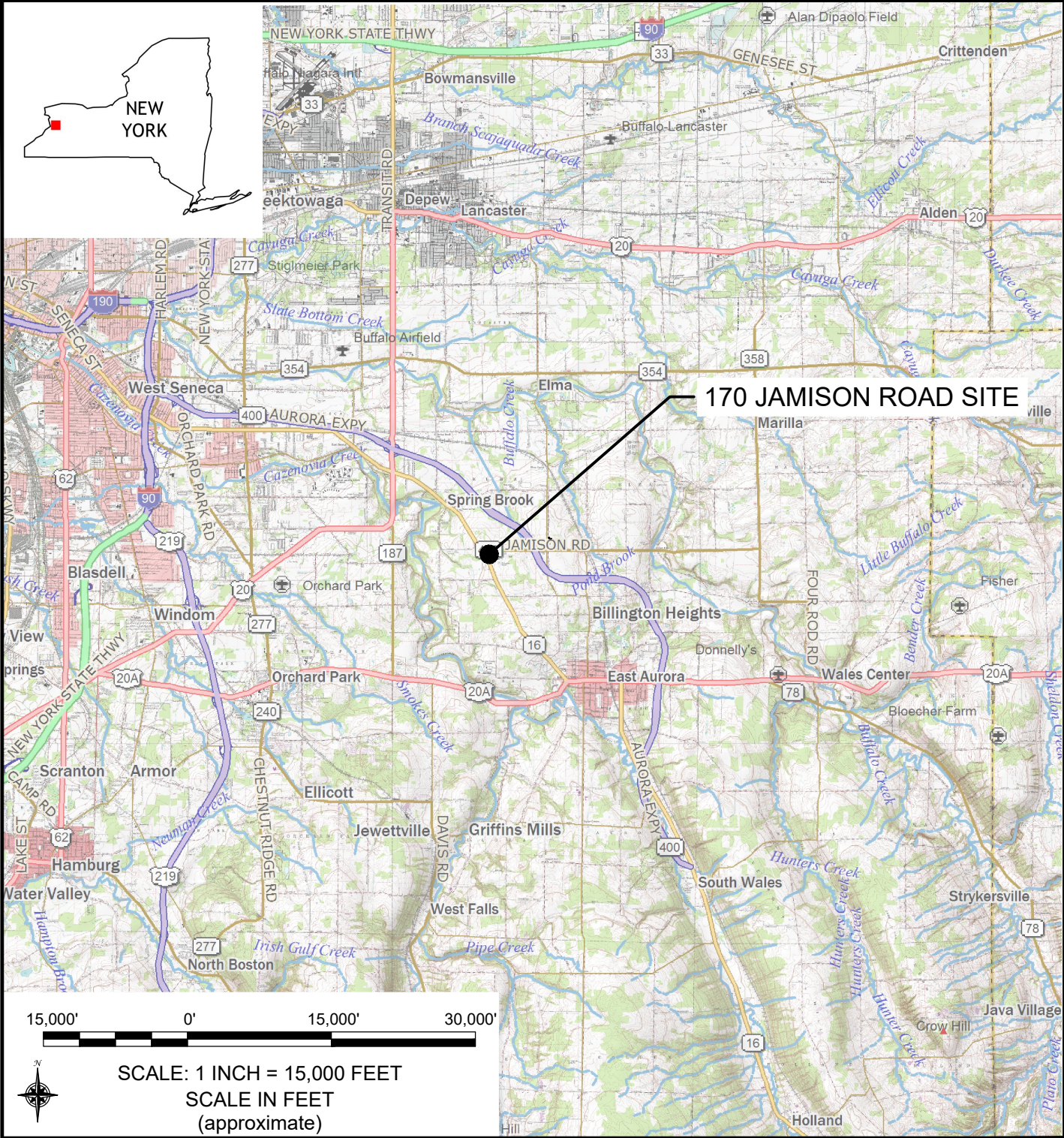
1. United States Environmental Protection Agency (USEPA) *“Indoor Air Vapor Intrusion Mitigation Approaches”*. October 2008
2. United States Environmental Protection Agency (USEPA) *“OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air”*. June 2015
3. New York State Department of Health (NYSDOH) *“Guidance for Evaluating Soil Vapor Intrusion in the State of New York”*. October 2006.
4. ASTM E2121-13, *“Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings”*, ASTM International, West Conshohocken, PA. 2013
5. AARST Consortium on National Radon Standards CC-1000, *“Soil Gas Control Systems in New Construction of Buildings”*. 2018

# FIGURES



**FIGURE 1**

F:\CAD\Benchmark\Moog\170 Jamison Road\07B - ASD System Exist Bldgs\2020\Figure 1: Site Location & Vicinity Map.dwg, 1/22/2020 10:13:26 AM



<p><b>BENCHMARK</b> ENVIRONMENTAL ENGINEERING &amp; SCIENCE, PLLC</p>	<p>2558 HAMBURG TURNPIKE SUITE 300 BUFFALO, NY 14218 (716) 856-0599</p>
	<p>PROJECT NO.: 0400-017-001</p>
	<p>DATE: JANUARY 2020</p>
<p>DRAFTED BY: RFL</p>	

**SITE LOCATION & VICINITY MAP  
EXISTING BUILDINGS 1 AND 3**

ASD SYSTEM DESIGN REPORT



170 JAMISON ROAD SITE  
ELMA, NEW YORK

PREPARED FOR  
MOOG INC.

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**LEGEND:**

-  BCP SITE BOUNDARY
-  NEW BUILDING 1A AND 3A

**NOTES:**

- 1. GOOGLE IMAGE FROM SEPTEMBER 2018



SCALE: 1 INCH = 100 FEET  
SCALE IN FEET  
(approximate)



**SITE PLAN**  
EXISTING BUILDINGS 1 AND 3  
ASD SYSTEM DESIGN  
170 JAMISON ROAD SITE  
ELMA, NEW YORK

PREPARED FOR  
**MOOG INC.**

**FIGURE 2**

  
2556 HAMBURG TURNPIKE  
SUITE 300  
BUFFALO, NY 14218  
(716) 856-0599

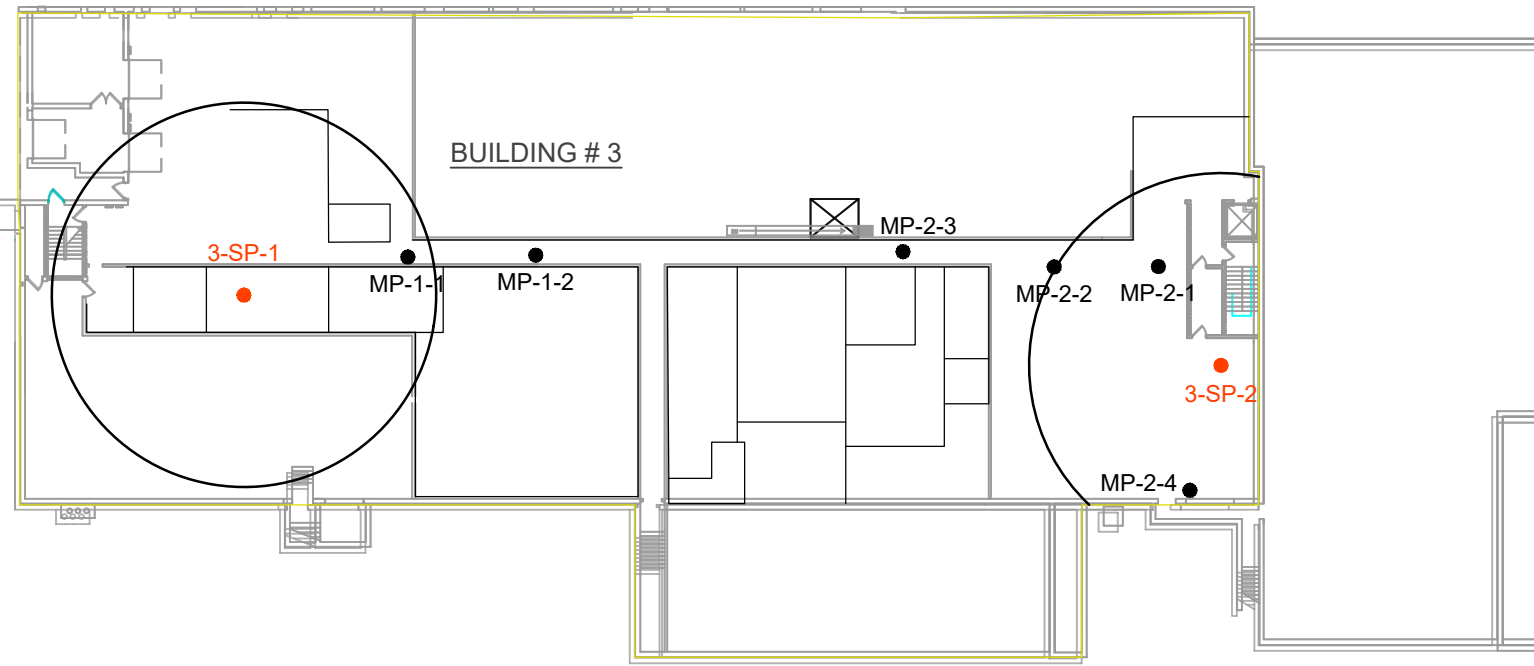
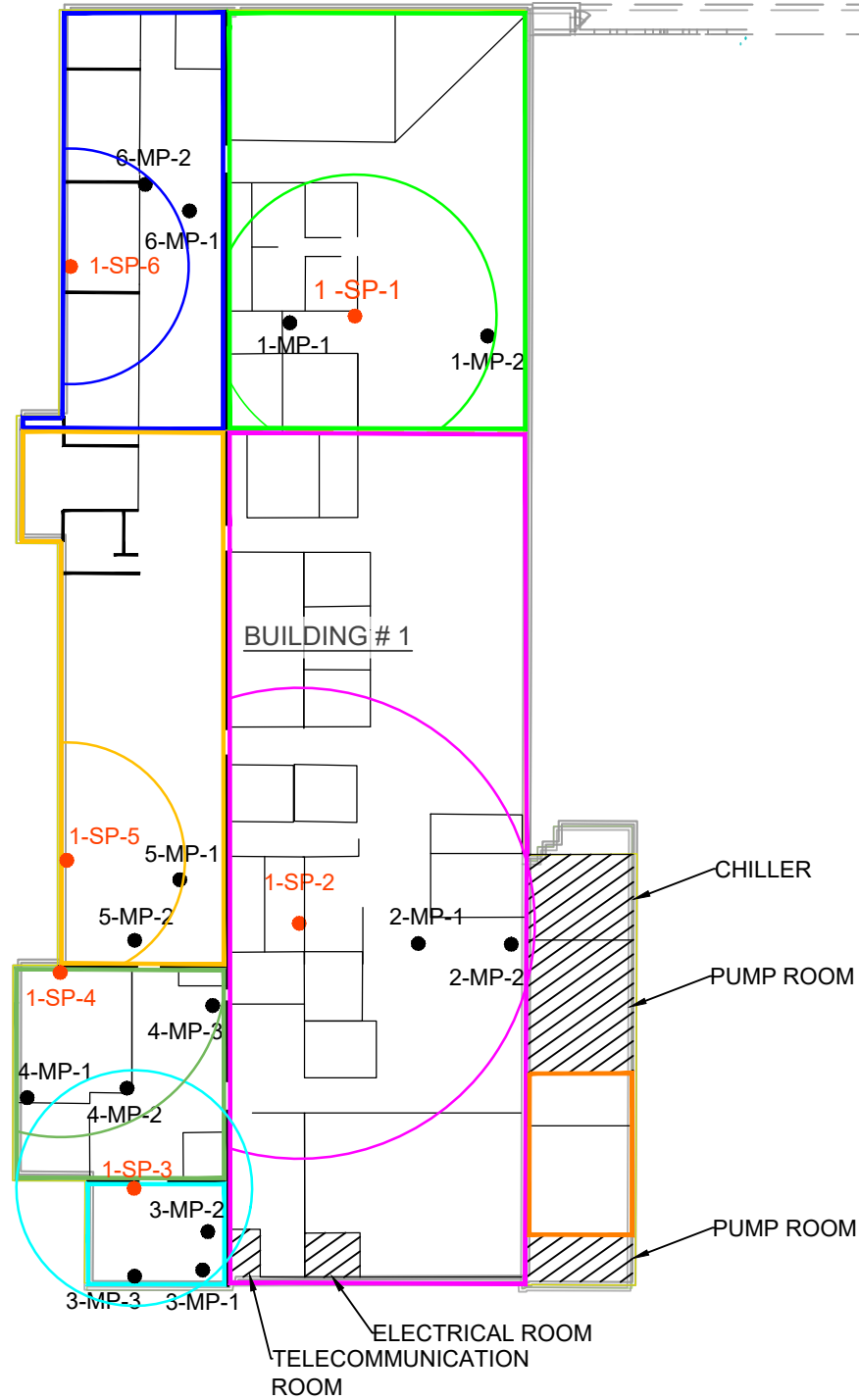
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LEGEND:

- SUB-AREA 1
- SUB-AREA 2
- SUB-AREA 3
- SUB-AREA 4
- SUB-AREA 5
- SUB-AREA 6
- SUB-AREA 7
- 1-SP-1 SUCTION POINT LOCATION
- 1-MP-1 MEASURING POINT LOCATION
- UNOCCUPIED SPACE
- RESPECTIVE SUB-AREA RADIUS OF INFLUENCE (ROI)



Sub-Area	Vacuum Point <sup>1,2</sup>	Vacuum Monitoring Point	Distance (ft)	Manometer Reading (in of H <sub>2</sub> O <sup>3</sup> )	Fan Vacuum (in of H <sub>2</sub> O)	Design Basis ROI (FT) <sup>4</sup>
<b>Building 1</b>						
Sub-Area 1	1-SP-1	1-MP-1	14	-0.045	3.9 inch vacuum	30
		1-MP-2	30	-0.007	3.9 inch vacuum	
Sub-Area 2	1-SP-2	2-MP-1	24	-0.087	3.8 inch vacuum	50
		2-MP-2	45	-0.071	3.8 inch vacuum	
Sub-Area 3	1-SP-3	3-MP-1	23	-0.004	10 inch vacuum	25
		3-MP-2	18	-0.035	3.77 inch vacuum	
		3-MP-3	19	-0.016	3.77 inch vacuum	
Sub-Area 4	1-SP-4	4-MP-1	27	-0.011	3.4 inch vacuum	35
		4-MP-2	28	-0.01	3.4 inch vacuum	
		4-MP-3	33	-0.008	3.4 inch vacuum	
Sub-Area 5	1-SP-5	5-MP-1	24	-0.008	8.08 inch vacuum	25
		5-MP-2	22	-0.005	8.08 inch vacuum	
Sub-Area 6	1-SP-6	6-MP-1	28	-0.002	6.6 inch vacuum	25
		6-MP-2	24	-0.011	6.6 inch vacuum	
<b>Building 3</b>						
Not Applicable	3-SP-1	MP-1-1	24	-0.027	3.8 inch vacuum	40
		MP-1-2	40	-0.004	3.8 inch vacuum	
	3-SP-2	MP-2-1	22	-0.044	3.8 inch vacuum	
		MP-2-2	37	-0.015	3.8 inch vacuum	
		MP-2-3	46	-0.002	3.8 inch vacuum	
		MP-2-4	37	-0.019	3.8 inch vacuum	

- NOTES:
- 1-SP-1, 1-SP-2 (BLDG. 1), 3-SP-1, 3-SP-2 (BLDG. 3) COMPLETED ON 11/7/2017.
  - 1-SP-3, 1-SP-4, 1-SP-5, AND 1-SP-6 COMPLETED ON 1/21/2020.
  - in of H<sub>2</sub>O = VACUUM READING IN INCHES OF WATER
  - ROI = RADIUS OF INFLUENCE



**BUILDING 1 & 3 COMMUNICATION TESTING RESULTS**

ASD SYSTEM DESIGN REPORT  
170 JAMISON ROAD SITE  
ELMA, NEW YORK

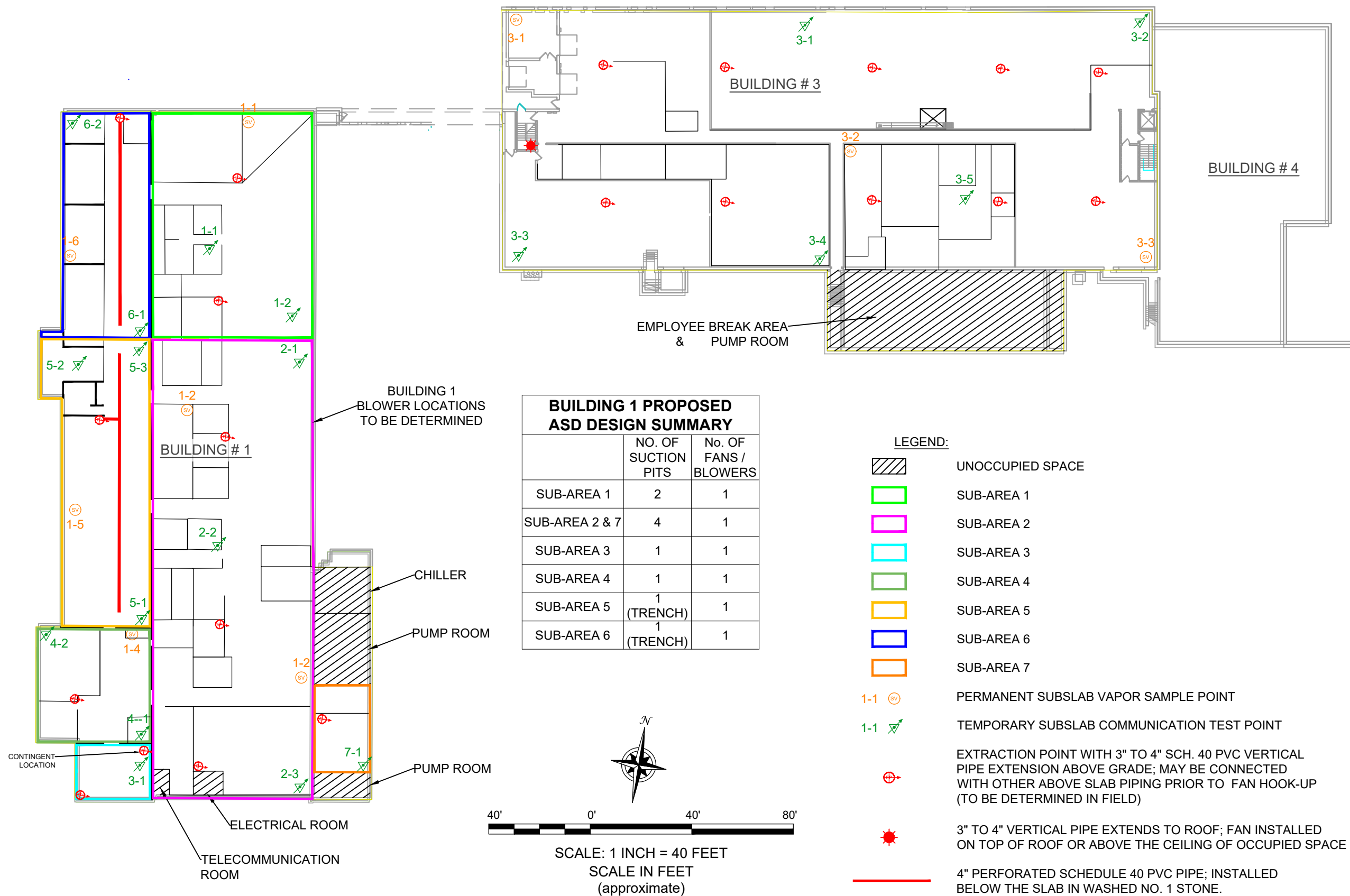
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ENGINEERING &  
SCIENCE, PLLC  
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SUITE 300  
BUFFALO, NY 14218  
(716) 856-0599

JOB NO.: 0400-017-001

PREPARED FOR  
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**FIGURE 3**

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**PROPOSED ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN**

ASD SYSTEM DESIGN REPORT  
170 JAMISON ROAD SITE  
ELMA, NEW YORK

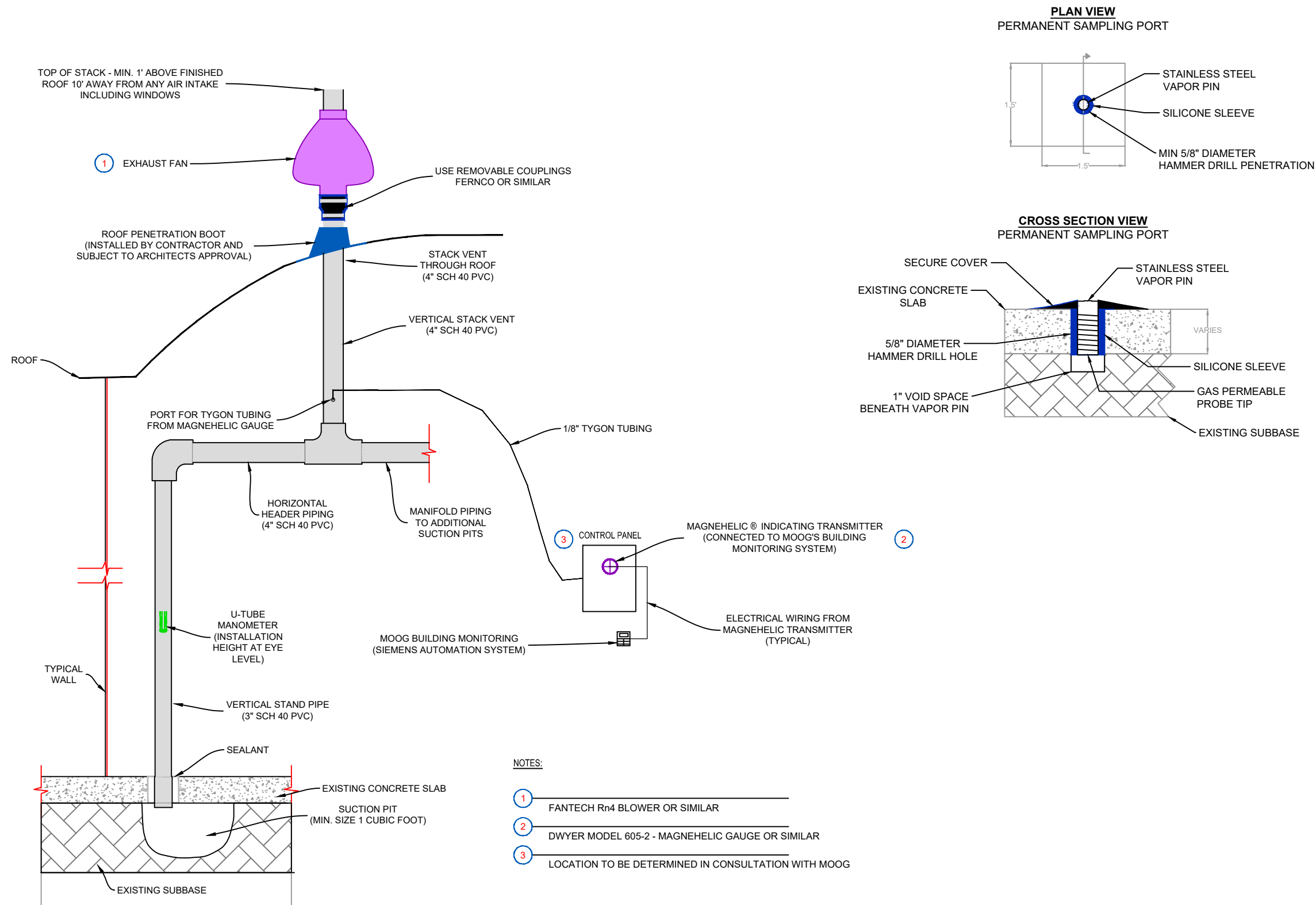
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**FIGURE 4**

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**TYPICAL ASD SYSTEM SCHEMATIC  
EXISTING BUILDING 1: SUB-AREAS 1, 2, & 7**

ASD SYSTEM DESIGN  
170 JAMISON ROAD SITE  
ELMA, NEW YORK

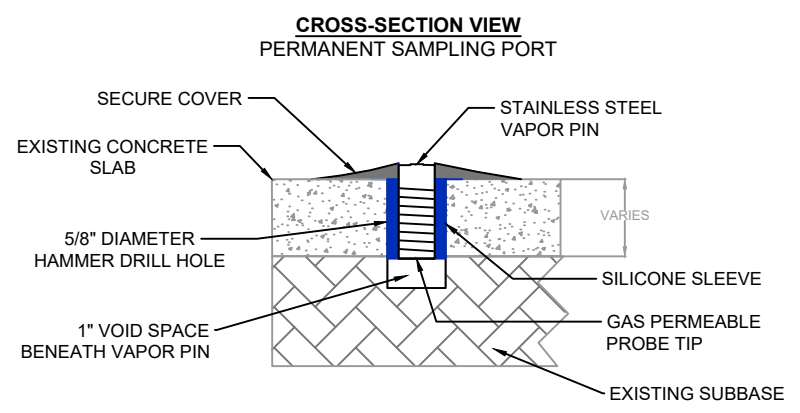
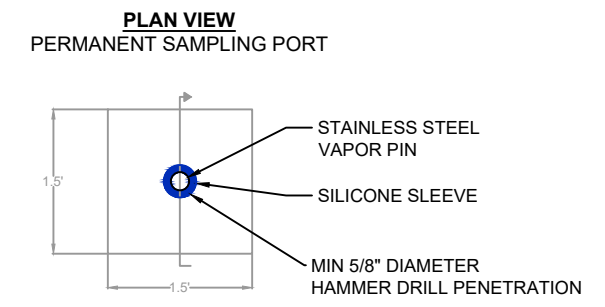
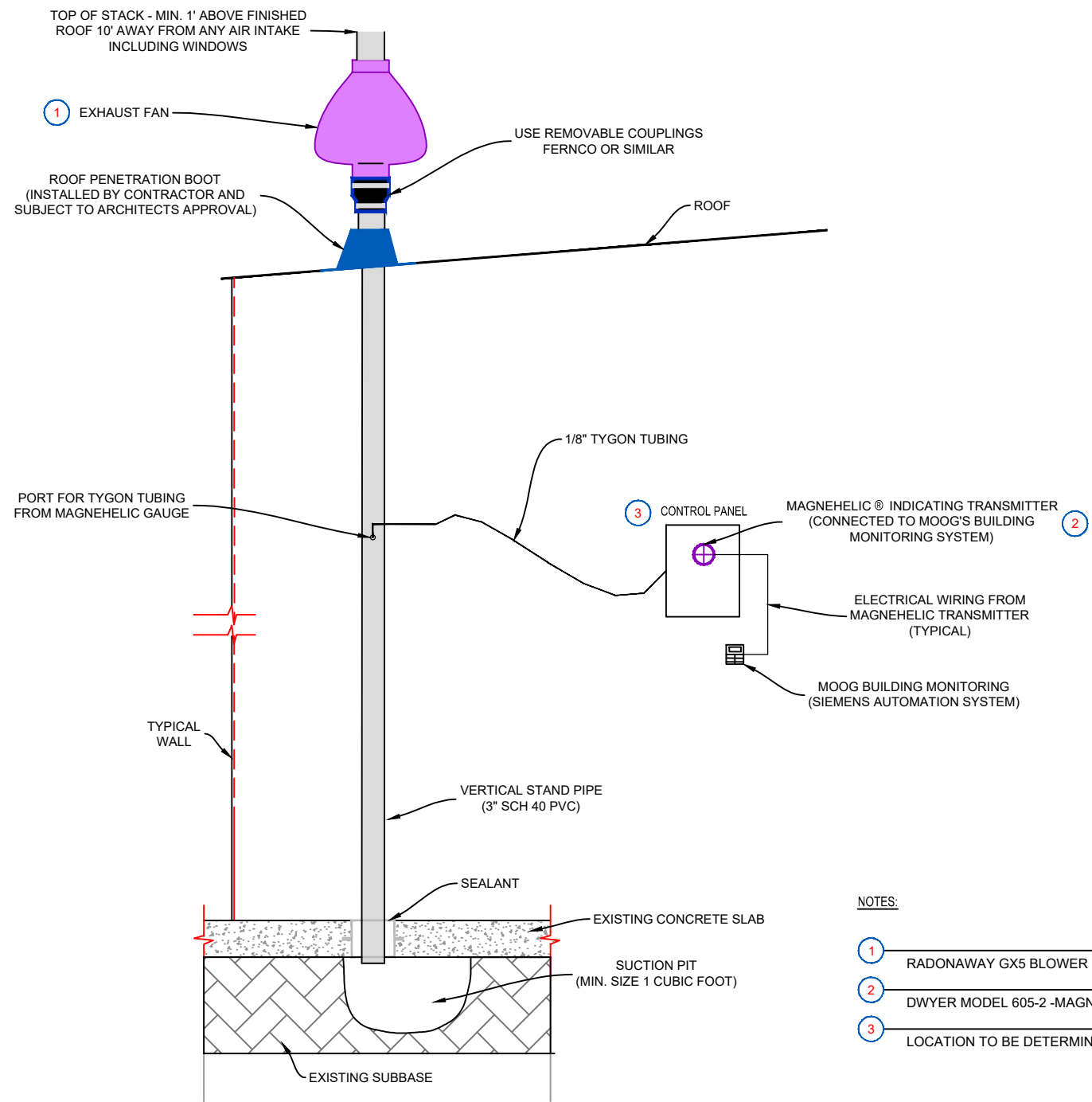


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**FIGURE 5**

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- NOTES:
- 1 RADONAWAY GX5 BLOWER OR SIMILAR
  - 2 DWYER MODEL 605-2 -MAGNEHELIC GAUGE OR SIMILAR
  - 3 LOCATION TO BE DETERMINED IN CONSULTATION WITH MOOG

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**TYPICAL ASD SYSTEM SCHEMATIC  
EXISTING BUILDING 1: SUB-AREAS 3 & 4**

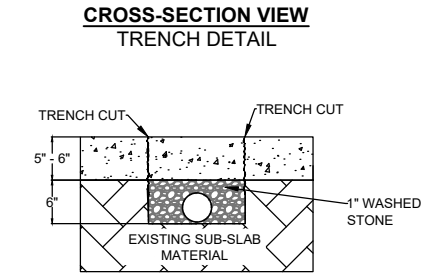
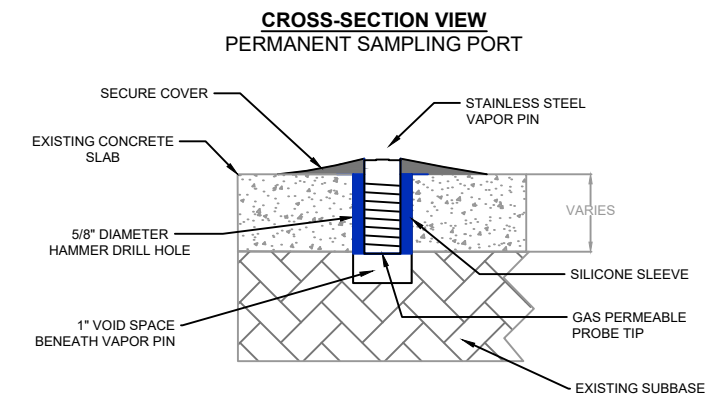
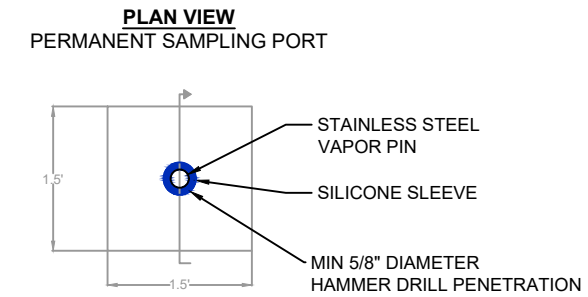
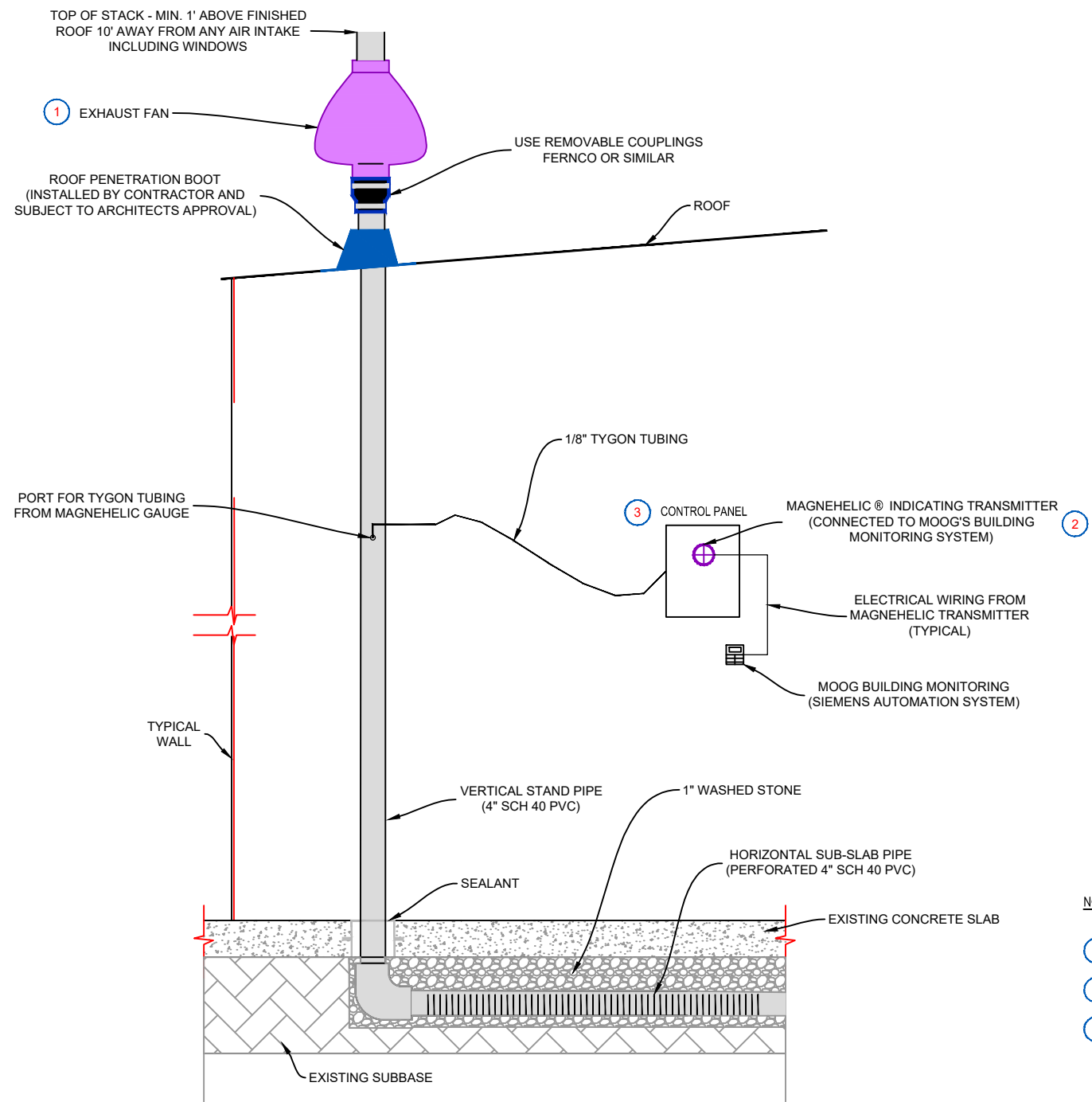
ASD SYSTEM DESIGN

170 JAMISON ROAD SITE  
ELMA, NEW YORK

PREPARED FOR  
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**FIGURE 6**

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- NOTES:
- 1 FANTECH Rn4 BLOWER OR SIMILAR
  - 2 DWYER MODEL 605-2 -MAGNEHELIC GAUGE OR SIMILAR
  - 3 LOCATION TO BE DETERMINED IN CONSULTATION WITH MOOG

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**TYPICAL ASD SYSTEM SCHEMATIC  
EXISTING BUILDING 1: SUB-AREAS 5 & 6**

ASD SYSTEM DESIGN

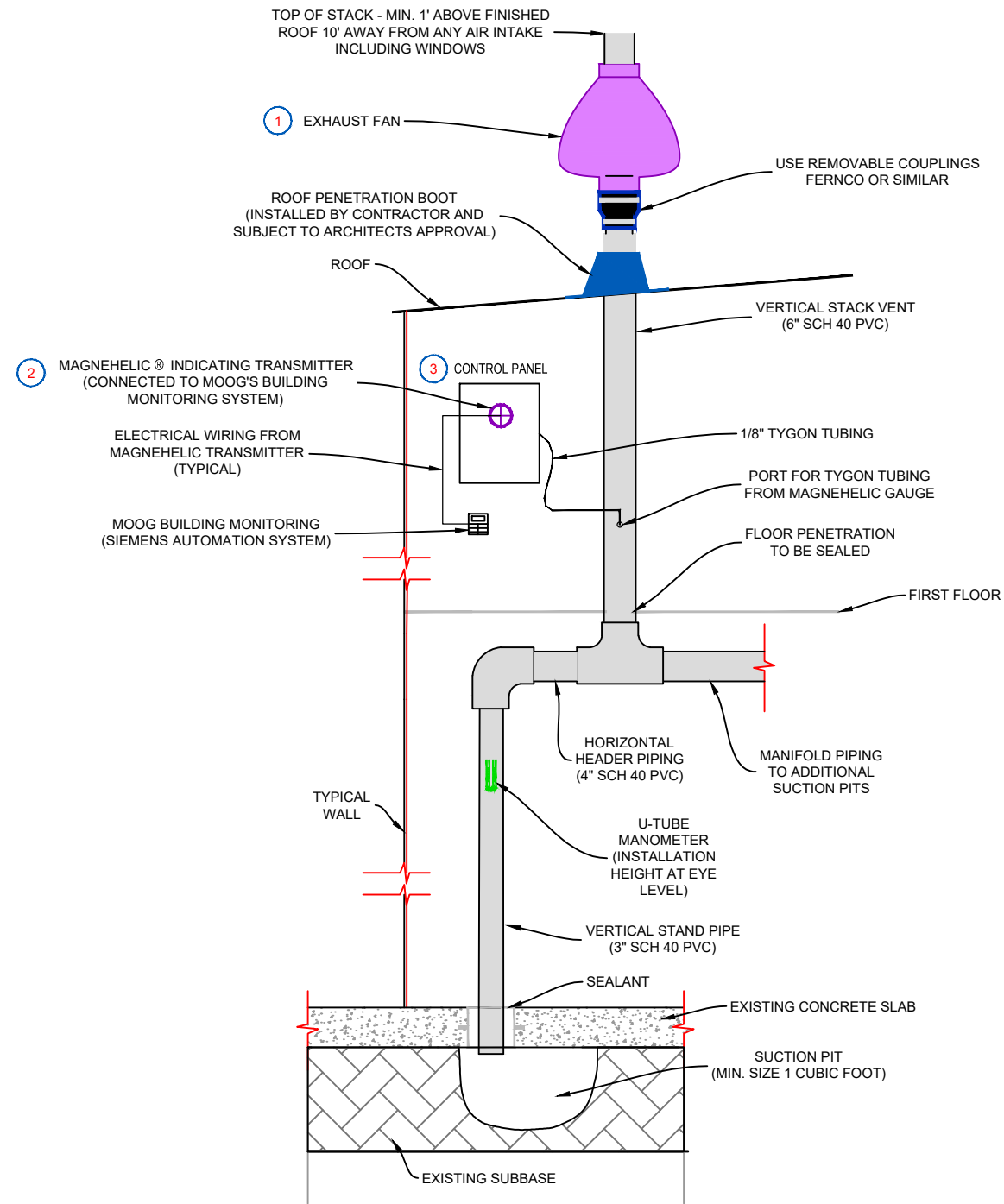
170 JAMISON ROAD SITE  
ELMA, NEW YORK

PREPARED FOR  
MOOG INC.

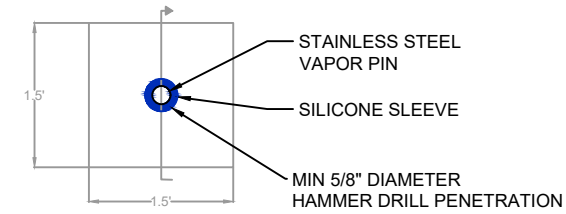
**FIGURE 7**

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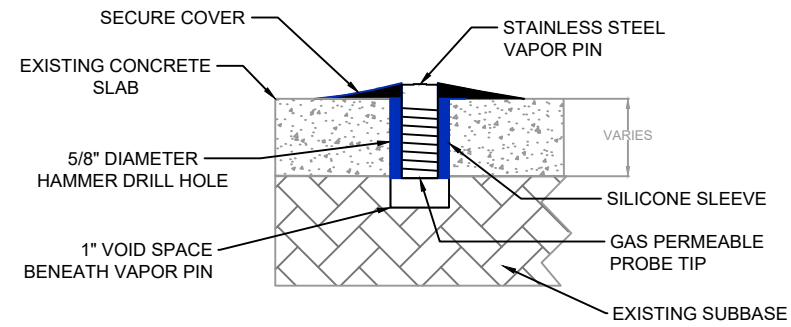




PLAN VIEW  
PERMANENT SAMPLING PORT



CROSS-SECTION VIEW  
PERMANENT SAMPLING PORT



NOTES:

- 1 PLASTEC STORM 12 BLOWER OR SIMILAR
- 2 DWYER MODEL 605-2 -MAGNEHELIC GAUGE OR SIMILAR
- 2 LOCATION TO BE DETERMINED IN CONSULTATION WITH

**TYPICAL ASD SYSTEM SCHEMATIC  
EXISTING BUILDING 3**

ASD SYSTEM DESIGN  
170 JAMISON ROAD SITE  
ELMA, NEW YORK

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JOB NO.: 0400-017-001

**FIGURE 8**



# APPENDIX 1

## EXHAUST BLOWER PRODUCT INFORMATION

# Installation and Operation Manual Manuel d'installation et d'opération

Item #: 142001  
Rev Date: 2019-07-19

## Rn2EC / Rn4EC



Inline EC Radon Fan • Ventilateur pour radon en ligne EC

### PARTS IN THE BOX (Rn2EC)

Inline Radon Fan Rn, 1 pc  
Operation and Installation Manual, 1 pc

### PIÈCES DANS LA BOÎTE (Rn2EC)

Ventilateur pour radon en ligne Rn, 1 pc  
Manuel d'installation, 1 pc

### PARTS IN THE BOX (Rn4EC)

Inline Radon Fan Rn, 1 pc  
LDVI™ Couplings, 2 pcs  
Operation and Installation Manual, 1 pc

### PIÈCES DANS LA BOÎTE (Rn4EC)

Ventilateur pour radon en ligne Rn, 1 pc  
Couplages LDVI™, 2 pcs  
Manuel d'installation, 1 pc



Rn2EC



Rn4EC

REGISTER\* THIS PRODUCT TO  
INCREASE YOUR PRODUCT  
WARRANTY BY AN EXTRA YEAR

[registration.fantech.app](https://registration.fantech.app)



\* in USA only

### Technical / Customer Support:






Support technique et service à la clientèle

United States Tel.: 800.747.1762

Canada Tel.: 800.565.3548



**fantech**®  
a systemair company

				
Note	Warning / Important note Avertissement / Note importante	Information	Technical information Information technique	Practical tip Conseil pratique



**DO NOT CONNECT POWER SUPPLY until fan is completely installed.  
Make sure electrical service to the fan is in the locked "OFF" position.**

1. Fantech recommends installation of this product by a trained, licensed, certified mitigation professional. Incorrect installation will void any and all product warranties or liability. Verification of safe/acceptable radon levels after installation is required.

Check your local code restrictions for additional safety measures that may be needed for proper code compliant installation.

2. This fan has rotating parts and safety precaution should be exercised during installation, operation and maintenance.

3. **WARNING! TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS - OBSERVE THE FOLLOWING:**

- a. Use this unit in the manner intended by the manufacturer. If you have any questions, contact your manufacturer's representative or contact us directly.
- b. **CAUTION:** Before installation, servicing or cleaning unit, switch power off at service panel and lock the service disconnection means to prevent power from being switched on accidentally. When the service disconnection means cannot be locked, securely fasten a prominent warning device, such as tag, to the panel.
- c. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- d. The combustion airflow needed for safe operation of fuel burning equipment may be affected by this unit's operation. Follow the heating equipment manufacturer's guidelines and safety standards such as those published by the National Fire Protection Association (NFPA), the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) and the local code authorities.
- e. When cutting or drilling into wall and ceiling, do not damage electrical wiring and other hidden utilities.
- f. Ducted fans must always be vented to the outdoors.

4. **WARNING!** Check voltage at the fan to see if it corresponds to the motor name plate.

5. For radon mitigation use only. **DO NOT** use to exhaust hazardous or explosive materials and vapors.

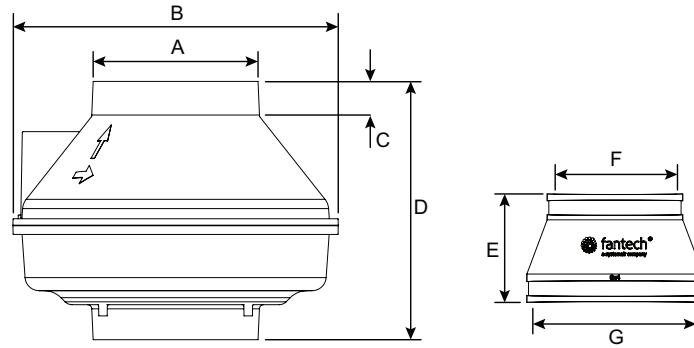
6. Do not use this fan with any solid state speed control device.

**GUARDS MUST BE INSTALLED WHEN FAN IS WITHIN REACH OF PERSONNEL OR WITHIN SEVEN (7) FEET OF WORKING LEVEL OR WHEN DEEMED ADVISABLE FOR SAFETY.**



The ducting from this fan to the outside of the building has a strong effect on the air flow, noise and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated air flow.

# DIMENSIONS



Model/ Modèle	A	B	C	D	E	F	G
Rn2EC	4 15/32 (114)	10 (254)	1 1/4 (32)	9 1/4 (235)	-	-	-
Rn4EC-3	5 7/8 (149)	11 1/2 (292)	1 1/4 (32)	9 1/4 (235)	4 (102)	3 1/2 (89)	6 (152)
Rn4EC-4	5 7/8 (149)	11 1/2 (292)	1 1/4 (32)	9 1/4 (235)	4 (102)	4 1/2 (114)	6 (152)

Dimensions in inches (mm).  
Dimensions en pouces (mm)

# INSTALLATION

Rn2EC-3 & Rn4EC-3 are designed for use with 3" schedule 40 PVC pipe.  
Rn2EC-4 & Rn4EC-4 are designed for use with 4" schedule 40 PVC pipe.

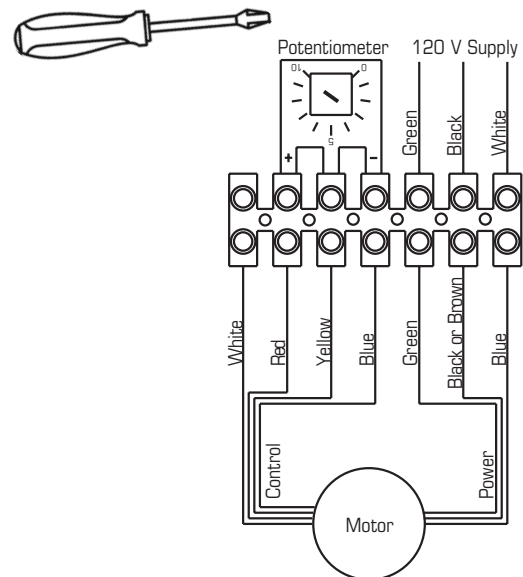
Prior to installation, the suction pipe should be terminated at the exterior wall. The suction pipe should be installed with slight incline to drain water from the fan.



# WIRING DIAGRAM



To reduce fan speed use a small screwdriver and turn potentiometer knob counter clockwise



**DO NOT** connect fan directly to building structure

# WARRANTY

## Five (5) Year Warranty

This warranty supersedes all prior warranties

### DURING ENTIRE WARRANTY PERIOD:

Fantech will repair or replace any part which has a factory defect in workmanship or material. Product may need to be returned to the Fantech factory, together with a copy of the bill of sale and identified with RMA number.

### FOR FACTORY RETURN YOU MUST:

- Have a Return Materials Authorization (RMA) number. This may be obtained by calling Fantech either in the USA at 1.800.747.1762 or in CANADA at 1.800.565.3548. Please have bill of sale available.
- The RMA number must be clearly written on the outside of the carton, or the carton will be refused.
- All parts and/or product will be repaired/replaced and shipped back to buyer; no credit will be issued.

### OR

The Distributor may place an order for the warranty part and/or product and is invoiced. The Distributor will receive a credit equal to the invoice only after product is returned prepaid and verified to be defective.

FANTECH WARRANTY TERMS DO NOT PROVIDE FOR REPLACEMENT WITHOUT CHARGE PRIOR TO INSPECTION FOR A DEFECT. REPLACEMENTS ISSUED IN ADVANCE OF DEFECT INSPECTION ARE INVOICED, AND CREDIT IS PENDING INSPECTION OF RETURNED MATERIAL. DEFECTIVE MATERIAL RETURNED BY END USERS SHOULD NOT BE REPLACED BY THE DISTRIBUTOR WITHOUT CHARGE TO THE

## Limitation of Warranty and Liability

This warranty does not apply to any Fantech product or part which has failed as a result of faulty installation or abuse, incorrect electrical connections or alterations made by others, or use under abnormal operating conditions or misapplication of the product or parts. We will not approve for payment any repair not made by us or our authorized agent without prior written consent. The foregoing shall constitute our sole and exclusive warranty and our sole exclusive liability, and is in lieu of any other warranties, whether written, oral, implied or statutory. There are no warranties which extend beyond the description on the page hereof. In no event, whether as a result of breach of contract, or warranty or alleged

## Warning

Fantech products are designed and manufactured to provide reliable performance, but they are not guaranteed to be 100% free from defects. Even reliable products will experience occasional failures and this possibility should be recognized by the user. If these products are used in a

END USER, AS CREDIT TO DISTRIBUTOR'S ACCOUNT WILL BE PENDING INSPECTION AND VERIFICATION OF ACTUAL DEFECT BY FANTECH.

### THE FOLLOWING WARRANTIES DO NOT APPLY:






- Damages from shipping, either concealed or visible. Claim must be filed with freight company.
- Damages resulting from improper wiring or installation.
- Damages or failure caused by acts of God, or resulting from improper consumer procedures, such as:
  1. Improper maintenance
  2. Misuse, abuse, abnormal use, or accident, and
  3. Incorrect electrical voltage or current.
- Removal or any alteration made on the Fantech label control number or date of manufacture.
- Any other warranty, expressed, implied or written, and to any consequential or incidental damages, loss or property, revenues, or profit, or costs of removal, installation or reinstallation, for any breach of warranty.

### WARRANTY VALIDATION

- The user must keep a copy of the bill of sale to verify purchase date.
- These warranties give you specific legal rights, and are subject to an applicable consumer protection legislation. You may have additional rights which vary from state to state.

negligence, defect incorrect advice or other causes, shall Fantech be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of equipment or any other associated equipment, cost of capital, cost of substitute equipment, facilities or services, downtime costs, or claims of customers of purchase for such damages. Fantech neither assumes or authorizes any person to assume for it any other liability in connection with the sale of product(s) or part(s). Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to you.

life support ventilation system where failure could result in loss or injury, the user should provide adequate backup ventilation, supplementary natural ventilation, failure alarm system, or acknowledge willingness to accept the risk of such loss or injury.

				
Note	Avertissement / Note importante	Information	Information technique	Conseil pratique



**NE PAS BRANCHER À L'ALIMENTATION ÉLECTRIQUE avant l'installation complète du ventilateur.**

**Assurez-vous que l'alimentation électrique du ventilateur est en position hors tension verrouillée (OFF).**

1. Fantech recommande l'installation de ce produit par un professionnel de l'atténuation formé, agréé et certifié. Une installation incorrecte entraînera l'annulation de toutes les garanties ou responsabilités du produit. La vérification des niveaux de radon sécuritaires / acceptables après l'installation est requise.  
Vérifiez les restrictions de votre code local pour les mesures de sécurité supplémentaires qui peuvent être nécessaires pour une installation conforme au code approprié.
2. Ce ventilateur comporte des pièces rotatives; il est essentiel de faire preuve de prudence pendant l'installation, le fonctionnement et l'entretien.
3. **AVERTISSEMENT! POUR RÉDUIRE LE RISQUE D'INCENDIE, D'ÉLECTROCUTION OU DE BLESSURES, VEUILLEZ RESPECTER LES RÈGLES SUIVANTES :**
  - a. Utilisez cet appareil de la manière prévue par le fabricant. Si vous avez des questions, communiquez avec le représentant du fabricant ou directement avec nous.
  - b. **MISE EN GARDE :** Avant d'installer, de réparer ou de nettoyer l'appareil, coupez l'alimentation électrique au panneau de service et bloquez les dispositifs de sectionnement pour éviter que l'alimentation ne soit rétablie par accident. Si les dispositifs de sectionnement ne peuvent pas être bloqués, apposez une note d'avertissement bien visible, comme une étiquette, sur le panneau de service.
  - c. Tous les travaux relatifs à l'installation et aux fils électriques devraient être effectués par un technicien qualifié, conformément aux normes et aux règlements en vigueur, y compris les travaux de construction classés résistants au feu.
  - d. Le fonctionnement de cet appareil pourrait modifier la circulation d'air de combustion nécessaire au fonctionnement sécuritaire des appareils de combustion. Suivez les consignes du fabricant pour les appareils de chauffage et respectez les normes de sécurité comme celles établies par la National Fire Protection Association (NFPA), la American Society for Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) ainsi que les codes des autorités locales.
  - e. Lorsque vous coupez ou percez un mur ou un plafond pour l'installation de l'appareil, assurez-vous de ne pas endommager le câblage électrique et les autres services publics cachés.
  - f. Les conduits d'air des ventilateurs doivent toujours être éventés à l'extérieur.
4. **AVERTISSEMENT!** Vérifiez la tension du ventilateur pour confirmer qu'elle correspond à celle inscrite sur la plaque signalétique du moteur.
5. Uniquement pour la mise en oeuvre de mesures d'atténuation du radon. **NE PAS** utiliser pour évacuer des vapeurs ou des substances dangereuses ou explosives.
6. Ne pas utiliser cet appareil avec une commande de vitesse à semiconducteurs.

**DES DISPOSITIFS PROTECTEURS DOIVENT ÊTRE INSTALLÉS SI LE VENTILATEUR SE TROUVE À PORTÉE DE MEMBRES DU PERSONNEL OU À SEPT (7) PIEDS OU MOINS DU NIVEAU DE FONCTIONNEMENT OU LORSQU'ILS SONT JUGÉS NÉCESSAIRES POUR DES RAISONS DE SÉCURITÉ**



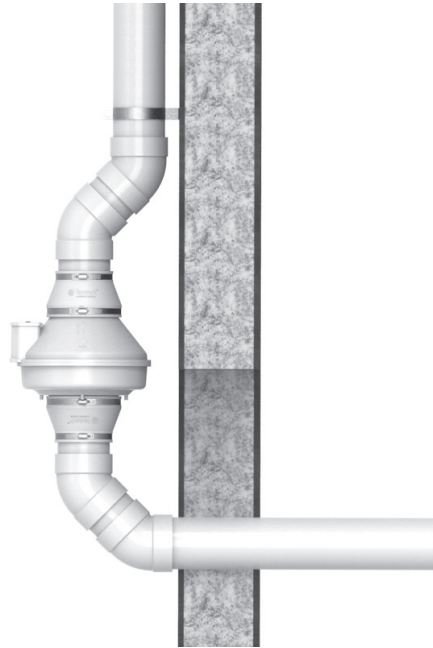
Le conduit de raccordement de ce ventilateur avec l'extérieur de l'immeuble a un effet important sur le débit d'air, le bruit et la consommation d'énergie du ventilateur. Veuillez utiliser le conduit le plus court et le plus droit possible pour obtenir un rendement optimal, et évitez d'installer des conduits plus petits que ceux recommandés pour le ventilateur. L'isolation autour des conduits peut réduire les pertes d'énergie et empêcher la moisissure. Les ventilateurs installés avec des conduits existants pourraient ne pas offrir le débit d'air nominal.

# INSTALLATION

Le modèle Rn2EC-3 & Rn4EC-3 est conçu pour un usage avec des conduits de PVC de série 40 de 3 po.

Le modèle Rn2EC-4 & Rn4EC-4 est conçu pour un usage avec des conduits de PVC de série 40 de 4 po.

Avant l'installation, il faut prévoir une sortie pour le tuyau d'aspiration sur un mur extérieur. Le tuyau d'aspiration devrait être installé avec une pente légère pour drainer l'eau du ventilateur.

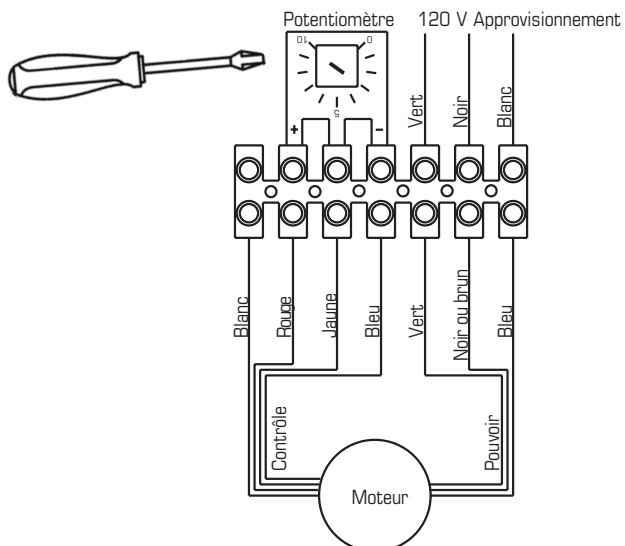


NE PAS attacher le ventilateur directement dans la structure du bâtiment.

## SCHÉMA ÉLECTRIQUE



Pour réduire la vitesse du ventilateur, utilisez un petit tournevis et tournez le bouton du potentiomètre dans le sens inverse des aiguilles d'une montre.



# GARANTIE

## Garantie de 5 ans

**Cette garantie remplace toutes les garanties précédentes.**

### DURANT TOUTE LA PÉRIODE DE GARANTIE:

Fantech s'engage à réparer ou à remplacer toute pièce présentant un défaut d'usine en matière de qualité d'exécution ou de matériau. Il sera peut être nécessaire de retourner le produit à l'usine Fantech, accompagné d'une copie du contrat de vente et du numéro d'autorisation de retour.

### POUR RETOURNER UN PRODUIT À L'USINE, VOUS DEVEZ:

- Obtenir un numéro d'autorisation de retour; pour ce faire, communiquer avec Fantech aux États-Unis au numéro 1.800.747.1762, ou au Canada, au numéro 1.800.565.3548. Veuillez avoir votre contrat de vente à portée de la main.
- S'assurer que le numéro d'autorisation de retour est lisible sur l'extérieur de la boîte, sinon la boîte sera refusée.
- Toutes les pièces et/ou le produit seront réparés ou remplacés puis retournés à l'acheteur. Aucun crédit ne sera accordé.

OU

Le Distributeur peut commander une pièce ou un produit couvert par la garantie; la facture lui sera envoyée. Le distributeur ne sera crédité du montant de sa facture qu'après que le produit a été retourné port payé et qu'il a été trouvé défectueux.

LES TERMES DE LA GARANTIE DE Fantech NE PRÉVOIENT PAS DE REMPLACEMENT SANS FRAIS AVANT QUE LA PIÈCE OU LE PRODUIT DÉFECTUEUX AIT ÉTÉ INSPECTÉ. LES PRODUITS OU PIÈCES REMPLACÉS AVANT L'INSPECTION DE LA DÉFECTUOSITÉ SERONT FACTURÉS ET LE MONTANT DU CRÉDIT EST FONCTION DE L'INSPECTION DE LA PIÈCE OU DU PRODUIT RETOURNÉ. LE DISTRIBUTEUR NE DOIT PAS REMPLACER SANS FRAIS POUR

## Limites de garanties et de responsabilités

Cette garantie ne s'applique à aucun produit de Fantech ou à aucune pièce détachée dont la défectuosité relève d'une erreur d'installation ou d'abus ou de mauvaise installation électrique ou dut à des modifications extérieures ou utilisées dans des conditions anormales ou encore une mauvaise installation du produit ou des pièces détachées. Nous n'approuverons aucun remboursement pour des réparations qui ne sont pas effectuées par un agent américain ou un agent autorisé sans un accord écrit. Ce dernier constituera notre seule et exclusive garantie et notre seule exclusive responsabilité et tient lieu de toute autre garantie ou bien écrite ou orale implicite ou statuaire. Aucune garantie ne s'appliquera au-delà des descriptions faites de la page ci-dessus. En aucun cas, que ce soit pour une rupture de contrat ou de garanties ou

## Avertissement

Les produits de Fantech sont conçus et fabriqués pour produire des performances fiables, mais il n'y a aucune garantie qu'ils soient 100% sans défaut. Les plus produits les plus fiables ont occasionnellement des défectuosités et cette possibilité devrait être reconnu par les usagers. Si ces produits sont utilisés comme une source de ventilation ou leur panne risque de mettre en danger des vies humaines ou entraîner des

L'UTILISATEUR FINAL L'ÉQUIPEMENT DÉFECTUEUX RETOURNÉ PAR L'UTILISATEUR FINAL, CAR LE COMPTE DU DISTRIBUTEUR NE SERA CRÉDITÉ QU'APRÈS L'INSPECTION ET LA VÉRIFICATION PAR FANTECH DE LA DÉFECTUOSITÉ.

### LES GARANTIES NE S'APPLIQUENT PAS DANS LES CAS SUIVANTS:

- Dommages dus au transport (dissimulés ou visibles). Les réclamations doivent être faites à la compagnie de fret.
- Dommages dus au mauvais câblage ou à l'installation inappropriée.
- Dommages ou défectuosité causés par une calamité naturelle ou résultant d'une procédure irrégulière de l'acheteur, notamment :
  1. Entretien irrégulier
  2. Mauvais usage, usage abusif, usage anormal ou accident
  3. Tension ou courant électrique incorrect
- Enlèvement ou toute modification du numéro de contrôle ou de la date de fabrication de l'étiquette Fantech
- Toute autre garantie expresse, écrite ou implicite, pour les dommages accidentels ou indirects, perte de biens, de recettes, manque à gagner ou coûts relatifs à la dépose, à l'installation ou à la réinstallation, en cas de violation de garantie.

### CERTIFICATION DE LA GARANTIE:

- L'utilisateur doit conserver une copie du contrat de vente pour confirmer la date d'achat.
- Les présentes garanties vous donnent des droits spécifiques reconnus par la loi et sont régies par les lois sur la protection du consommateur appropriées. Il est possible que différents états offrent d'autres droits.

des dommages dut à la négligence ou a des conseils incorrects ou autres causes, Fantech ne pourra être tenu pour responsable des dommages particuliers ou consécutifs, incluant mais pas limités aux pertes et profits ou bénéfiques perte de matériel ou autres matériels associés. Coût du capital, coût des équipements de remplacement, matériels ou services, coût de temps d'arrêt ou les réclamations des clients pour de tels dommages. Fantech ne délègue ou autorise aucune personne d'assumer sa responsabilité sur la vente du produit ou des pièces détachées. Certaines juridictions ne permettent pas l'exclusion de la limitation des dommages accidentels ou consécutifs ainsi ces limitations ci-dessus et les exclusions ne s'appliquent pas à vous.

blessures, les usagers devront avoir une source de ventilation de secours en addition à une ventilation naturelle, le défaut de système d'alarme ou la connaissance de ces conditions entraînent sa responsabilité envers de telles pertes ou blessures.



Fantech reserves the right to make technical changes.  
For updated documentation please refer to [www.fantech.net](http://www.fantech.net)

Fantech se réserve le droit de faire des changements techniques. Pour de la documentation à jour, s'il vous plaît se référer au [www.fantech.net](http://www.fantech.net)

Fantech®

# Rn 4EC-4 Inline Radon Fan

Item Number: 99923

Variant: 120V 1~ 60Hz



- Use for **High Suction, High Airflow** applications
- Equipped with EC Motor
- Speed Control Included
- LDVI™ Couplings Included
- Airtight Housing Guaranteed
- Large Electrical Box
- Zero Leakage

Active radon mitigation systems employ specialized fans to exhaust radioactive radon gas from underneath building structures via a sealed pipe system. These systems are designed to remove radon gas before it migrates into the building envelope.

As the most powerful model in Fantech's family of Radon Mitigation fans, the **Rn4EC** can create 4.3" of suction while moving 20 cfm, as well as move 490 cfm when operating at only 0.5" of suction. High air flow, high suction.

**Rn4EC** features an electronically commutated (EC) motor. Inherently efficient and operationally stable at full and reduced speeds, the EC motor arms the radon professional with installation methods not previously practical. Integrated control system allows for "dialling in" the fan speed necessary to achieve either the required sub-slab depressurization or required system air flow rate. For demand-controlled systems, the potentiometer can be removed from the wiring terminal block to accommodate an externally-provided 0-10Vdc speed command.

The **Rn 4-4EC** is constructed with UL certified, UV protected polycarbonate material. The inlet and outlet pieces of the fan's housing are vibration welded for 100% leak-proof housing construction. Totally enclosed motors are designed with extra moisture protection in various radon applications.

Performance certified by **HVI**; safety certified by **UL**.

**NOTE:**

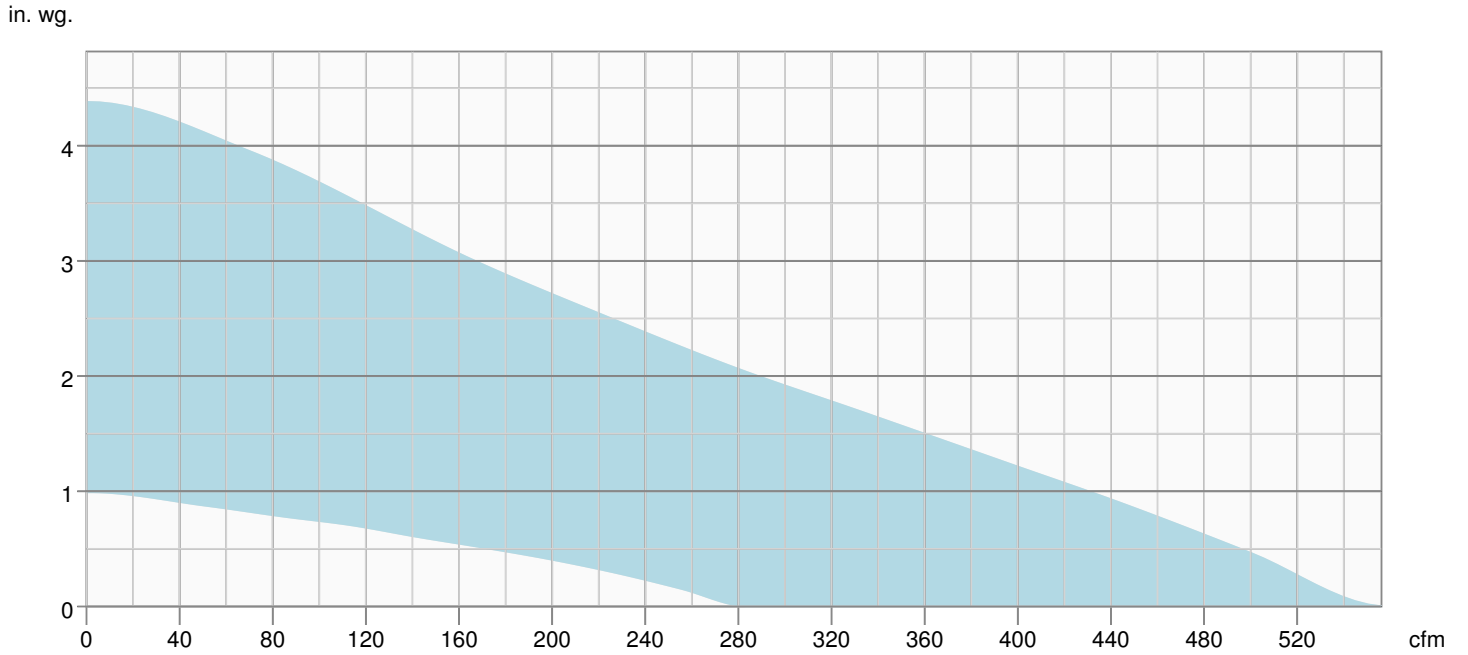
Installations that will result in condensate forming in the outlet ducting should have a condensate bypass installed to route the condensate outside of the fan housing. Conditions that are likely to produce condensate include but are not limited to: outdoor installations in cold climates, long lengths of outlet ducting, high moisture content in soil and thin wall or aluminum outlet ducting. Failure to install a proper condensate bypass may void any warranty claims



## Technical parameters

Nominal data		
Voltage (nominal)	120	V
Frequency	60	Hz
Phase(s)	1~	
Input power	169	W
Input current	2.1	A
Impeller speed	4,084	r.p.m.
Air flow	max 555.0	cfm
Protection/Classification		
Enclosure class, motor	IP54	
Insulation class	B	
Certificate	HVI, cULus	
Dimensions and weights		
Weight	7.3	lb

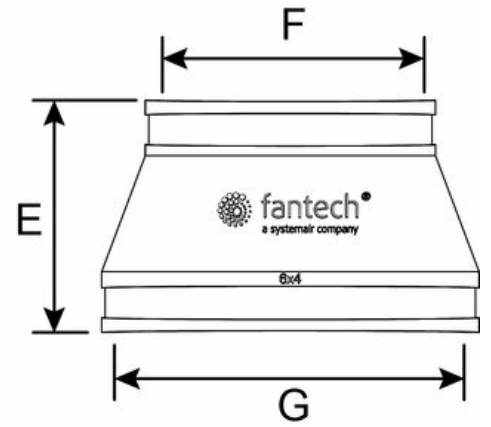
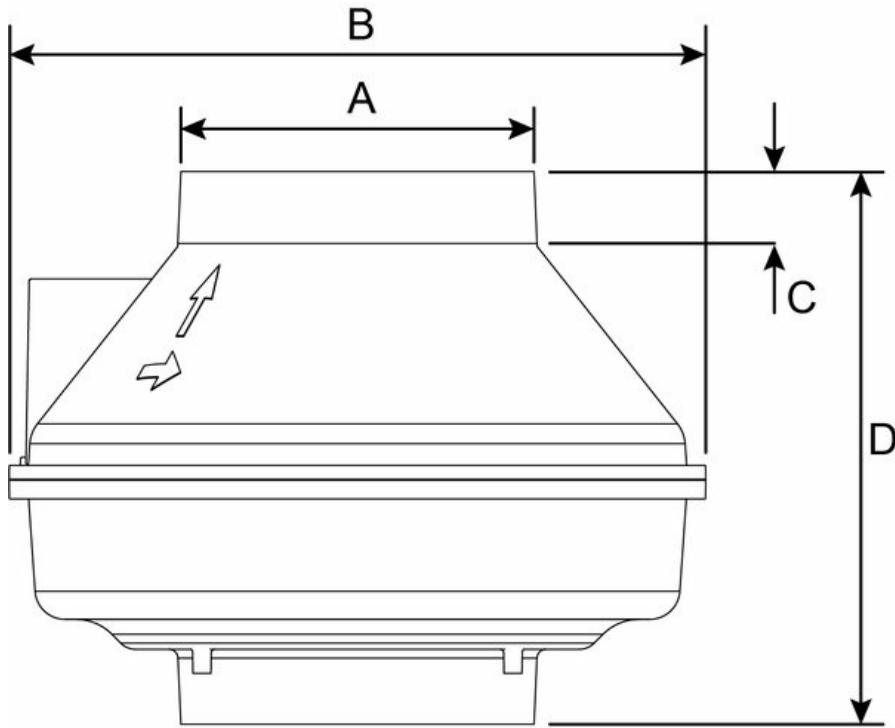
## Performance curve



### Hydraulic data

Required air flow	-
Required static pressure	-
Working air flow	-
Working static pressure	-
Air density	0.075 lb/ft <sup>3</sup>
Power	-
Fan control - RPM	-
Current	-
SFP	-
Control voltage	-
Supply voltage	-

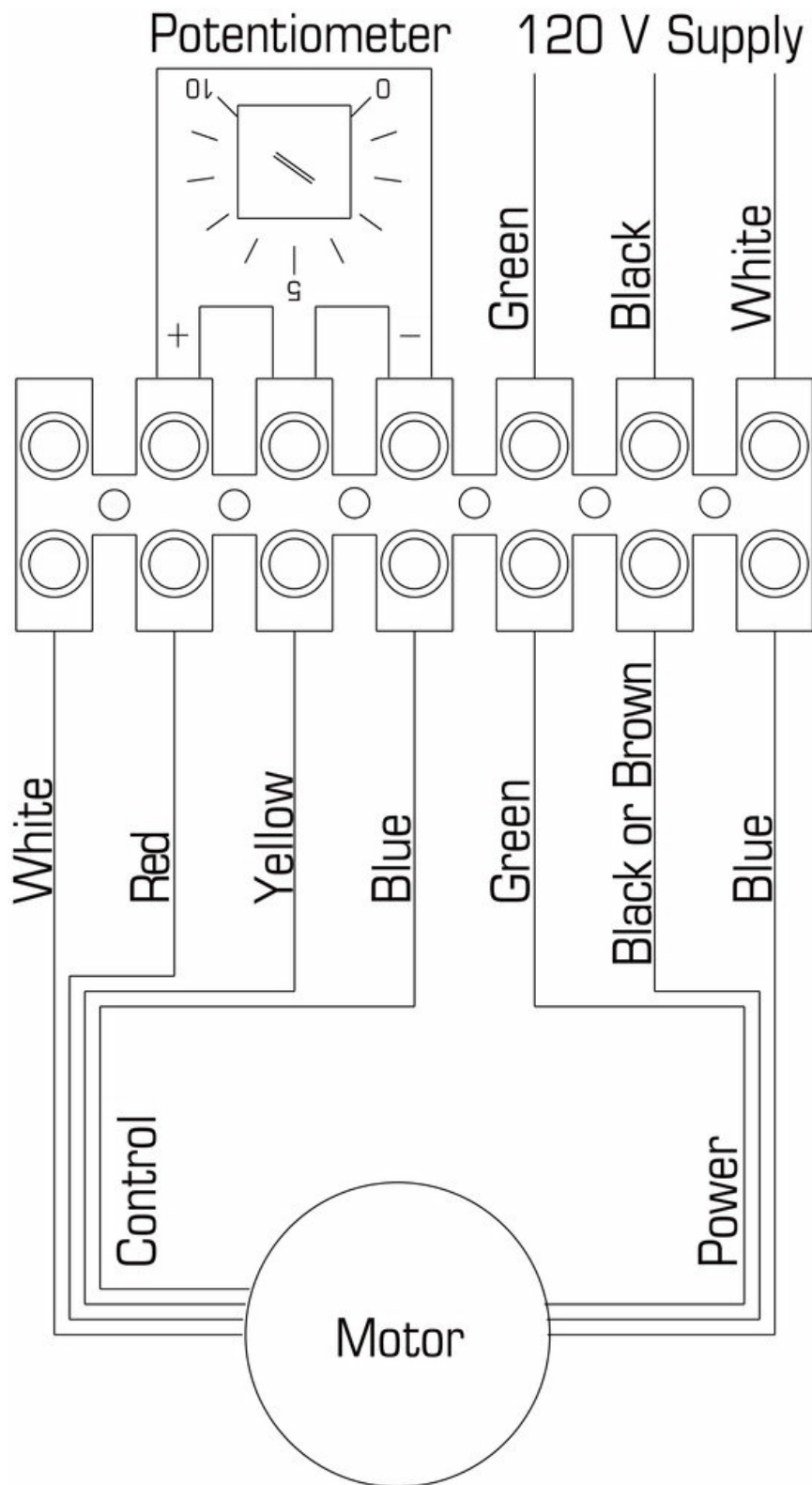
## Dimensions



Model	A	B	C	D	E	F	G
Rn2EC	4 15/32 (114)	10 (254)	1 1/4 (32)	9 1/4 (235)	-	-	-
Rn4EC-3	5 7/8 (149)	11 1/2 (292)	1 1/4 (32)	9 1/4 (235)	4 (102)	3 1/2 (89)	6 (152)
Rn4EC-4	5 7/8 (149)	11 1/2 (292)	1 1/4 (32)	9 1/4 (235)	4 (102)	4 1/2 (114)	6 (152)

Dimensions in inches (mm).

## Wiring



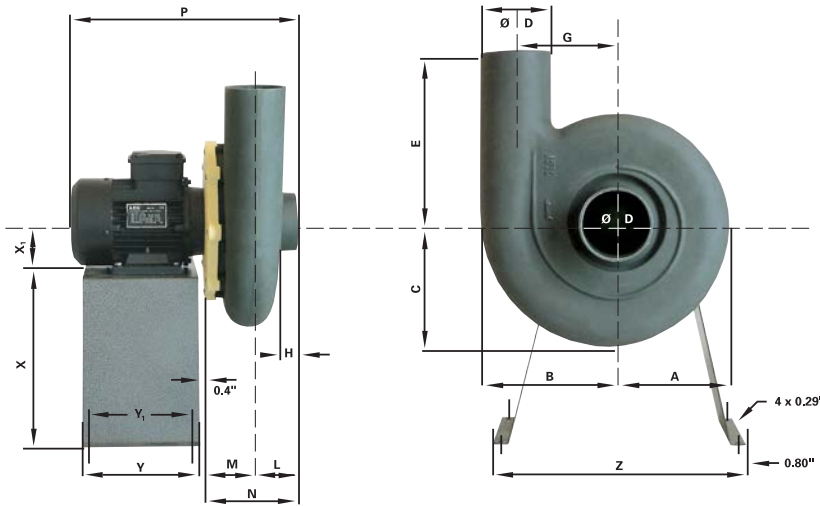
## Documents

- 142001 Rn2EC-Rn4-EC OIPM EN FR.PDF



# Performance & Dimensions

## Storm 12

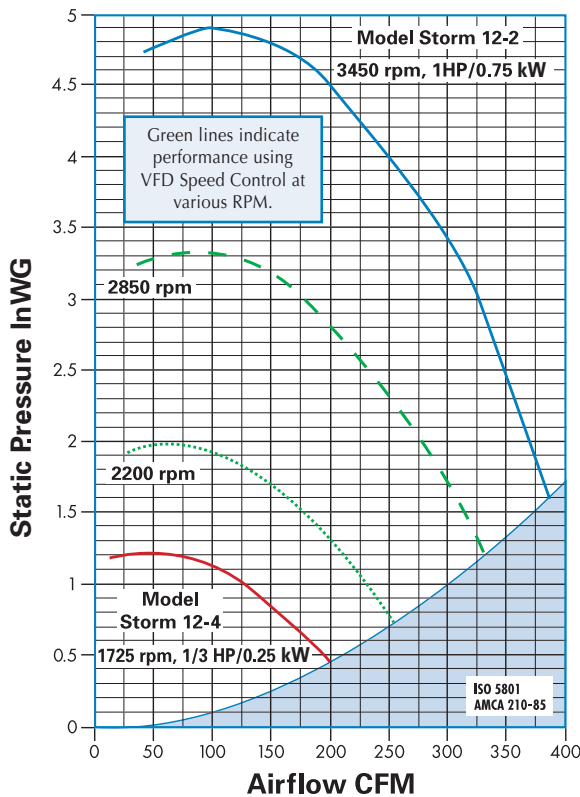


Metal stand does not come standard with fan (see accessories). Motor frame sizes may vary upon type of motor used.

### Dimensional Data (All dimensions in inches)

A	5.71	H	1.77	Y	7.09
B	6.89	L	3.15	Y <sub>1</sub>	6.30
C	6.42	M	2.83	Z	13.39
D	3.54	N	5.98	X	9.45
E	8.35	P	13.78	X <sub>1</sub>	2.80
G	5.12				

Wheel diameter: 7.75"



Type B  
Noise Level Test type B, visit our website for details

n (T/min) R.P.M.	dB (A)	dB
1450	71,7	83,9
1720	75,3	87,6
2850	85,8	98,1
3300	88,8	100,9

ISO 9614/1



Housing and motor noise level when fan is running near maximum output

n (T/min) R.P.M.	Global dB	Global dB (A)
1450	60,4	56,8
1720	65,2	61,5
2850	76,8	74
3300	80,5	77,8

For **Weather Protection** see optional accessory "Weather Hood/WH3 Pedestal" pictured at right.

Also available with optional WH5 Aluminum Weatherhood. (See Accessories)



### Rotation and Discharge for Centrifugal Fans

STANDARD POSITION

OPTIONAL FIELD ADJUSTABLE POSITIONS



Counter-Clockwise Up Blast CCW 360



Counter-Clockwise Top Angular Up Blast CCW 45



Counter-Clockwise Top Horizontal CCW 90



Counter-Clockwise Top Angular Down Blast CCW 135



Counter-Clockwise Down-Blast CCW 180



Counter-Clockwise Bottom Angular Down Blast CCW 225



Counter-Clockwise Bottom Horizontal CCW 270



Counter-Clockwise Bottom Angular Up Blast CCW 315

#### Notes:

- (1) Direction of rotation is determined from the drive side of fan. **Standard position is up-blast CCW 360.**
- (2) On single inlet fans, drive side is always considered as the side opposite fan inlet.





# PLASTEC VENTILATION, INC.

www.plastecvent.net Phone: 941-751-7596 Fax: 941-751-7598

## Submittal Data and Specifications

### Polypropylene Weather Hood and Pedestal – Models WH3 and WH4

**Material of Construction and Temperature Limitation:**

Polypropylene and stainless steel motor mounting hardware.  
 Temperature limitation is 140° F.

- Model WH3 Injection Molded Process
- Model WH4 Roto Molded Process

**Application:**

Provides corrosion resistant weather hood to protect utility blower motor on outside installations.

**Manufacturer:**

Shall be manufactured under the authority of Plastec Ventilation, Inc.

**Shall have the following Features and Benefits:**

- Attractive design
- Easy to install
- Light weight, but very strong
- UV treated corrosion resistant polypropylene



**WH3 with blower mounted and optional Disconnect Switch.**

PROJECT			ARCHITECT
CONTRACTOR	DATE	SUBMITTED BY	ENGINEER
<b>SPECIFICATION</b>			
RELATED FAN POSITION	MODEL #	QTY	NOTES

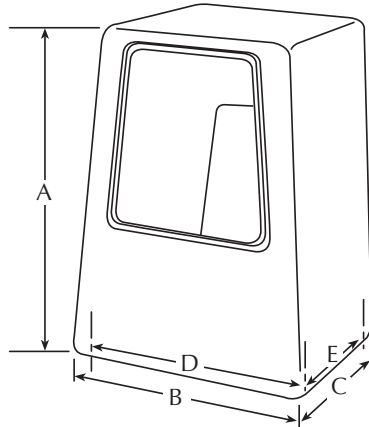
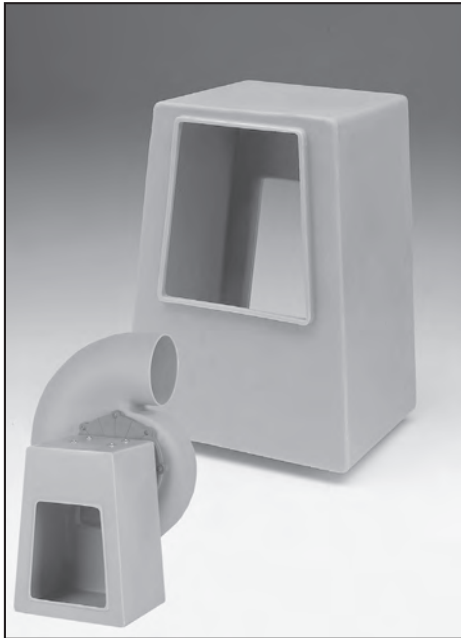


# PLASTEC VENTILATION, INC.

www.plastecvent.net Phone: 941-751-7596 Fax: 941-751-7598

## Submittal Data and Specifications

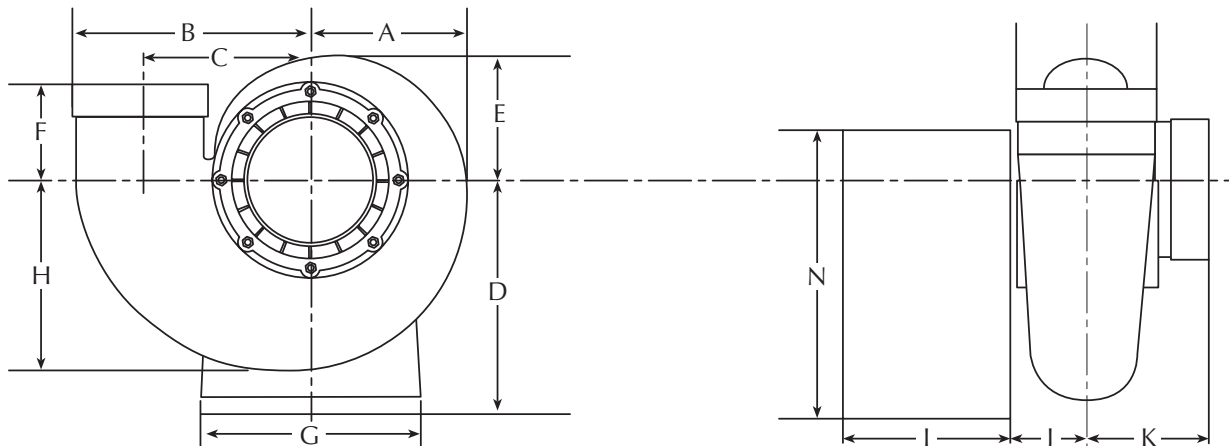
### Polypropylene Weather Hood and Pedestal – Models WH3 and WH4



**Description:** A polypropylene enclosure for Utility Blower models P15 through P35. It is specially designed for Plastec Fans to protect the motor against weather and corrosive environments.

DIMENSIONAL DATA (inches)					
	A	B	C	D	E
WH3 is for Plastec 15-30 / Storm Series	21.65	15.75	14.37	12.99	11.81
WH4 is for Plastec 35 / Storm Series	28.14	23.09	19.88	20.47	16.92

(WH4 includes SS Support Bracket for motor.)



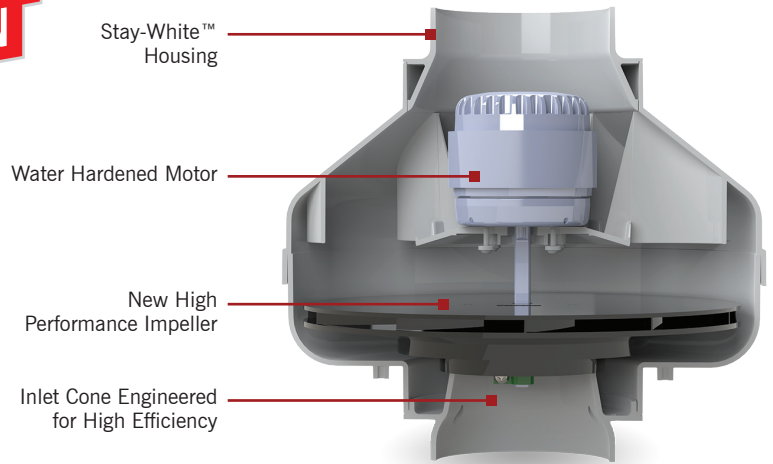
DIMENSIONAL DATA (inches)												
Blower Type	A	B	C	D	E	F	G	H	I	J	K	N
Plastec 15 - Storm 10	6.05	9.45	6.93	18.85	5.30	5.70	15.75	7.90	14.37	3.75	3.93	21.65
Plastec 20 - Storm 12	8.18	12.00	8.70	18.85	6.25	5.90	15.75	9.45	14.37	3.50	4.50	21.65
Plastec 25 - Storm 14	10.05	14.62	10.30	17.87	7.81	6.30	15.75	12.30	14.37	4.50	7.90	21.65
Plastec 30 - Storm 16	11.75	18.75	5.37	17.87	9.37	7.50	15.75	12.75	14.37	4.75	5.70	21.65
Plastec 35	14.56	22.44	16.25	23.14	11.81	5.11	23.03	17.71	19.88	6.69	8.26	28.14

# GX5 FAN



**COMING SOON**

GX5



## SPECIFICATIONS

MODEL	FAN DUCT DIAMETER	WATTS	RECOM. MAX. OP. PRESSURE "WC	TYPICAL CFM vs. STATIC PRESSURE WC					
				0"	1.0"	2.0"	3.0"	4.0"	5.0"
GX5	4"	77-133	5.0	174	150	121	87	50	8

See p. 22 for fan dimensions.



Made in the USA with U.S. and imported parts.



ETL Listed



RadonAway® inline radon fans are covered by our 5-year, hassle-free warranty.

## PRICING

MODEL	P/N	UNIT PRICE		
		1-3	4-7	8+
GX5	28536			

Quantity discounts determined by number of RadonAway® fans (any model) per order.



### TECH TIP 6.5" MANOMETER

Designed and manufactured in RadonAway's Massachusetts production facility, the new 6.5" Easy Read U-tube Manometer is made specifically for the GX5's higher vacuum pressure. However, since the gauge shows from 0" - 6.5" WC, it can also be used with other RadonAway radon fans.

For more information on the 6.5" Manometer, see p. 27.



## FEATURES

- Stay-White™ Housing
- Quiet Operation
- Water-Hardened Thermally-Protected Motor
- 4" Duct for Use with 3" or 4" Pipe
- Sealed Seams to Inhibit Radon Leakage
- Electrical Box for Hard Wire or Plug In
- For Indoor or Outdoor Use
- Rated for Commercial or Residential Use
- New Revolutionary Impeller
- Modern "RP Style" Housing

### Experience the POWER of the GX5!

Capable of operating at 5" of vacuum, our revolutionary GX5's power will blow you away.

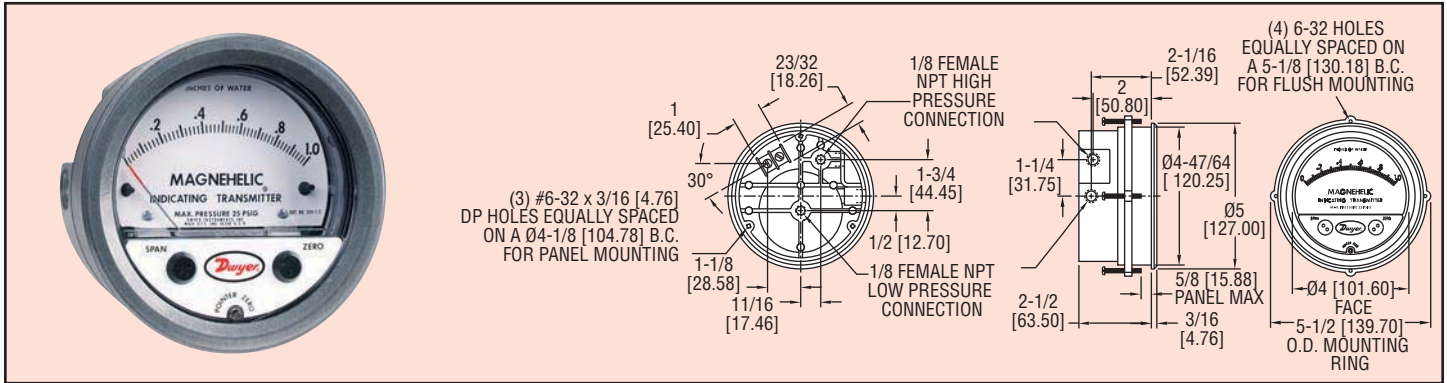
## **APPENDIX 2**

### **WARNING DEVICE PRODUCT INFORMATION**



Series  
605

# Magnehelic® Differential Pressure Indicating Transmitter



The Series 605 Magnehelic® Indicating Transmitter provides for both visual monitoring and electronic control of very low differential pressure. The Series 605 is ideal for control applications in building HVAC systems where local indication is desired during routine maintenance checks or necessary when trouble shooting the system. The easily read dial gage is complimented by the two-wire, 4-20 mA control signal utilizing the time-proven Dwyer® Magnehelic® gage mechanical design and Series 600 transmitter technology. The 2-wire design with terminal strip on the rear simplifies connection in any 4-20 mA control loop powered by a 10-35 VDC supply.

### SPECIFICATIONS

#### GAGE SPECIFICATIONS

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Accuracy:** See chart.

**Stability:** ±1% FS/yr.

**Pressure Limits:** See chart.

**Temperature Limits:** 20 to 120°F (-6.67 to 48.9°C).

**Process Connections:** 1/8" female NPT.

**Size:** 4" (101.6 mm) dial face, 5" (127 mm) OD x 2-11/16" (68.3 mm).

**Weight:** 1 lb, 12.6 oz (811 g).

**Agency Approvals:** CE.

#### TRANSMITTER SPECIFICATIONS

**Accuracy:** See chart (includes linearity, hysteresis, repeatability).

**Temperature Limits:** 20 to 120°F (-6.67 to 48.9°C).

**Compensated Temperature Range:** 32 to 120°F (0 to 48.9°C).

**Thermal Effect:** ±0.025% FS/°F (0.045% FS/°C).

**Power Requirements:** 10-35 VDC (2-wire).

**Output Signal:** 4 to 20 mA.

**Zero and Span Adjustments:** Protected potentiometers.

**Loop Resistance:** DC; 0-1250 Ω max.

**Current Consumption:** DC; 38 mA max.

**Electrical Connections:** Screw terminal block.

**Mounting Orientation:** Diaphragm in vertical position. Consult factory for other position orientations.

Model	Range in w.c.	Maximum Pressure	Electrical Accuracy ±%	Mechanical Accuracy ±%
605-00N	.05-0-.20	25 psi (1.7 bar)	2	4
605-11	.25-0-.25	25 psi (1.7 bar)	2	3
605-0	0-.50	25 psi (1.7 bar)	2	3
605-1	0-1.0	25 psi (1.7 bar)	2	2
605-2	0-2.0	2 psi (13.79 kPa)	0.5	2
605-3	0-3.0	2 psi (13.79 kPa)	0.5	2
605-6	0-6.0	2 psi (13.79 kPa)	0.5	2
605-10	0-10	2 psi (13.79 kPa)	0.5	2
605-20	0-20.0	11 psi (75.8 kPa)	0.5	2
605-30	0-30	11 psi (75.8 kPa)	0.5	2
605-50	0-50	11 psi (75.8 kPa)	0.5	2
	Range in Pa			
605-60PA	0-60	25 psi (1.7 bar)	2	4
605-125PA	0-125	25 psi (1.7 bar)	2	3
605-250PA	0-250	25 psi (1.7 bar)	2	2
605-500PA	0-500	2 psi (13.79 kPa)	0.5	2

### ACCESSORIES

**A-298,** Flat Aluminum Bracket - for flush mounting

**A-370,** Mounting Bracket - flush mount Series 605 Transmitter in bracket. Bracket is then surface mounted. Steel with gray hammertone epoxy finish

### OPTION

For NIST traceable calibration certificate, add suffix -NIST to model numbers.

Example: 605-3-NIST.

Process Tubing Options: See page 547 (Gage Tubing Accessories)  
Static Fitting Options: See page 548 (Static Pressure Tips)